



**NetMark
Baseline Survey on
Insecticide Treated
Materials (ITMs)
in Zambia**

May 2001



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ACRONYMS

AED	Academy for Educational Development
ITMs	Insecticide treated materials
ITNs	Insecticide treated nets
RI	Research International
SES	Socio-economic status
SFH	Society for Family Health
UNICEF	United Nations' Children's Fund
USAID	United States Agency for International Development
USD	US Dollars
WHO	World Health Organization
WRA	Women of reproductive age

MAP OF ZAMBIA



EXECUTIVE SUMMARY

- PURPOSE:** Provide baseline measures of
- Knowledge and beliefs about mosquitoes and malaria
 - Beliefs and attitudes about use of treated and untreated mosquito nets
 - Access, affordability, and ownership of mosquito nets
 - Net treatment practices
 - Use of nets and treated nets by vulnerable groups: children under five, pregnant women, and women of reproductive age
 - Consumer preferences regarding mosquito nets
 - Usage and attitudes regarding other mosquito control products

METHODOLOGY: Survey

SAMPLE: 1000 Zambian households from 5 sites: Lusaka, Kitwe, Mansa, Choma, and Kaoma. Target sample in each site was 200: 80 respondents from urban households, 60 from households within 100km, and 60 from households 100-200 km from the urban center. Respondents were women aged 15-49 who were mothers/guardians of children under five years of age.

DATA COLLECTION: October 2000

STUDY FINDINGS:

Knowledge and beliefs about malaria and mosquitoes

Recognition of the English term “malaria” was very high and knowledge of symptoms good; however knowledge about causes and vulnerable groups was moderate. Exposure to information about malaria prevention was moderate and came mainly from health services.

- Virtually all respondents (99.7%) reported having heard of the English term “malaria.” Although the vast majority of those who recognized the term knew that mosquitoes cause malaria (81%), a smaller percentage (42%) knew that mosquitoes are the *only* cause of malaria. Seventy-nine percent (79%) mentioned fever as a symptom and 47% mentioned “chills/shivering”, a symptom of fever; most named other symptoms that are also manifestations of malaria. Few (3%), however, mentioned convulsions, a symptom of severe malaria. Nearly two-thirds (63%) knew that children under five and pregnant women are the groups most susceptible to getting a serious case of malaria.
- Forty-two percent (42%) of the respondents had not received any information about avoiding malaria in the past 12 months. Of the 58% who saw/heard information, the majority heard it from staff in health facilities (62%), but other common sources were friends and relatives (23%) and the radio (21%). Fourteen percent (14%) had heard information *only* from non-professionals (friends, neighbors or relatives), rather than from more professional and presumably more reliable sources.

Perceived advantages and disadvantages of net use

Levels of perceived advantages of net use by vulnerable groups—children under five and pregnant women—were very high, while levels of perceived disadvantages were low. Nets were seen as providing good protection against mosquitoes and malaria. *Treated* nets were seen as especially effective, with the added advantage of killing and repelling mosquitoes. The small proportion of respondents citing disadvantages of a child sleeping under a net were concerned about suffocation or entrapment. Respondents cited stronger disadvantages of *treated* nets, voicing concerns about the safety of the chemical and its smell.

- Almost all respondents (98%) perceived advantages for a child under five sleeping under a mosquito net. Most commonly mentioned were “avoid getting bitten by mosquitoes”(87%) and “avoid getting malaria”(53%).
- The majority of respondents (81%) did not cite any disadvantages for a child under five sleeping under a mosquito net. The most commonly mentioned disadvantages were “child may suffocate”(6%); “child may get caught/trapped” (5%); and “not enough air under the net” (3%).
- The vast majority of respondents (89%) perceived advantages for a child under five sleeping under a *treated* net. The most commonly mentioned were “kills mosquitoes” (41%); “is better at preventing malaria” (35%); “repels mosquitoes away from net” (32%); and “kills/ repels other insects or pests” (30%).
- Most respondents (64%) did not cite any disadvantages for a child under five sleeping under a treated net. The most commonly mentioned disadvantages were concerns about the safety of the chemical: “the chemical is dangerous” (13%); “child might chew/suck net” (10%); “causes irritation/cough” (10%); and “chemical can kill” (9%).
- The vast majority of respondents (81%) perceived advantages for a pregnant woman sleeping under a *treated* net. Advantages had to do with the greater efficacy of a treated net: “is better at preventing malaria (39%); “the pregnant woman is more protected” (26%); “repels mosquitoes away from the net” (26%) and “works better against mosquitoes than a net that has not been treated” (20%).
- Most respondents (60%) did not cite any disadvantages for a pregnant woman sleeping under a treated net. The most commonly mentioned disadvantages had to do with safety and smell issues: “might make woman nauseated/vomit” (16%); “smell is bad” (14%); “causes irritation/cough” (11%); “chemical is dangerous” (10%); and “chemical can kill fetus/cause miscarriage” (10%).

Access to mosquito nets

Nets were available through different commercial and non-commercial outlets, with general shops and clinics/hospitals being reported as the most accessible. Some consumers said they would have to travel far to find nets. Others reported that nets are not available or they did not know where to get them.

- The nearest places where a mosquito net could be bought were general/Indian shop (36%) and clinic/hospital (24%). The average time to get to the nearest place of purchase was about one hour by foot or 75 minutes by bus.
- Fourteen percent (14%) of respondents reported that mosquito nets were not available or that they did not know where to get them. Seven percent (7%) reported that mosquito nets are “not available.”

Mosquito net ownership, treatment, and use

Net ownership in the study sites was moderate, and was highest in net project areas. Nets had been obtained from both commercial and non-commercial sources. Non-owners said that the main reason they did not own a net was cost. Use of nets by vulnerable groups was somewhat low, and nets were not used year-round. Awareness of treatment of nets with insecticide was moderate although relatively few people treated their nets.

- About one-quarter (27%) of households reported owning one or more mosquito nets, and 28% of these households owned more than one mosquito net. (These figures may be higher than the national average, given that two of the sample sites—Mansa and Kitwe—have active net promotion projects.) Ownership was higher in urban (35%) than in rural areas (21%). Households of higher the socio-economic statuses were more likely than households of lower socio-economic status to own a net.
- About half (51%) of all households had heard of treating mosquito nets with insecticide solution and 9% of households owned a treated mosquito net. About one-third (35%) of nets were treated: 27% had been pretreated when purchased and 15% were treated/re-treated after purchase. On average, those nets had been treated/re-treated 2 times and were last treated six months ago. Treatment was obtained mostly from non-commercial sources: clinics (40%), projects (18%), employers (6%) and as gifts (11%). Most people (86%) did not know what product was used for treating the net. Those from higher SES households were more likely to be aware of net treatments, but those from lower SES households were more likely to have a treated net.
- About half (48%) of children under five in net-owning households slept under a net (treated or untreated) the prior night, representing 12% of all children in the households in the sample. Only 16% of these children slept under a *treated* net the prior night, representing 4% of all children in the households in the sample. In net-owning households, a higher proportion of children under two slept under a net than did 2, 3, and 4 year olds. The proportion of net-owning households where all children under five slept under any net decreased the more children the household had.
- Forty-two percent (42%) of women of reproductive age (WRA) in net-owning households slept under a net (treated or untreated) the prior night, representing 11% of the total number of women of reproductive age in the households in the sample. Only 14% of WRA slept under a *treated* net the prior night, representing 4% of WRA in the households in the total sample. Eighteen percent (18%) of pregnant women in net-owning households slept under a net the prior night, representing 4% of pregnant women in the households in the total sample. Only 6% in net-owning households slept under a treated net the prior night, representing 1% of all pregnant women in the sample households. (The denominators for pregnant women, however, were very small.)
- For those household members who did sleep under mosquito nets, the average number of months per year they slept under nets was 6.6.
- Two or three people usually slept under a large net.
- The majority (88%) of non-net owners said they didn't own a net because they don't have enough money.

Characteristics of nets owned

Nets were obtained from both commercial and non-commercial sources. Over one-third were acquired within the past two years. Most were round/conical and double sized; average price among all nets was 5.30 USD. Nets are commonly unbranded products; consumers were unaware of the brand. Half the nets were reportedly washed at least once a month.

- About one third (32%) of nets were purchased from a general shop; 16% from the clinic; 8% from a project; and 6% as a gift; 12% were of unknown source. A higher percentage of nets in higher SES households were

purchased from a formal commercial source (fixed store) than those in lower SES households, which were more likely to obtain nets from non-commercial sources such as projects or clinics. Thirty-six percent (36%) of nets had been acquired within the past two years and 16% were acquired 5 or more years ago.

- Households reported paying an average of 5.30 USD per net (conversion based on the exchange rate for the dollar on the date of data collection).
- Owners did not know the brand name for the majority of nets (84%). Six percent (6%) of the nets were reported to be PowerNets. Five percent (5%) were tailor-made (non-manufactured) nets.
- The most common net sizes owned were double (62%) and single (21%); only 6% were king size and 0.6% cot-size. The most common shapes were round/conical (66%) and rectangular (27%).
- The great majority of nets (85%) had been washed. Half (51%) of washed nets were reportedly washed at least once a month with one-fourth (26%) reportedly washed at least every two weeks.

Consumer mosquito net preferences

Households, whether net-owning or not, generally preferred round/conical, king size, and white-colored nets.

- The majority of respondents (67%) preferred round/conical shaped nets; 24% preferred rectangular nets. Preferred sizes were king (51%) and double (35%).
- Forty percent (40%) of respondents preferred white nets; 16% light green. Over half (54%) disliked black nets; 26% disliked dark green; 23% disliked dark blue nets; and 22% disliked white nets.

Awareness, use, and price of mosquito control products

Mosquito nets, coils, and aerosol insecticides were the mosquito control products that consumers were most aware of. Use and frequency of purchase of commercial products was somewhat low.

- Awareness (unprompted) of mosquito control products was highest for mosquito nets (70%), mosquito coils (49%), and aerosol insecticide (43%); few respondents (8%) were aware of repellants. Aside from nets, the most frequently used products were coils (29%) and aerosols (20%). (These use figures may be low, given that “use” was asked only of those who indicated they were aware of a given product.) Use was higher in urban than in rural areas.
- The average reported prices were \$1.29 for 180-220 ml can of aerosol insecticide; \$1.64 for a 300-350 ml can; and \$0.17 for a single mosquito coil. Half (51%) of households that had purchased mosquito coils or aerosols in the 12 months prior to the interview did so within the last 3 months. Aerosols were generally purchased in supermarkets (43%) and in general shops (17%). Coils were most frequently purchased in kiosks (25%), markets (24%), and general shops (22%).

Perceptions of mosquito control attributes, products, and brands

Consumers wanted a mosquito control product that kills mosquitoes and reduces malaria. Among all other insect control products, nets were rated most highly on every positive mosquito control attribute, except “killing mosquitoes and other insects.” Consumers were most aware of Target brand and associated it with the insect control attributes they value.

- On a scale of 1-7, respondents said that the most important attributes of mosquito control products were “kills mosquitoes” (6.38) and “reduces malaria” (6.31).

- Respondents rated mosquito nets more highly than all other insect control products on “is a long-term solution to mosquito problems”(79%); “is safe to use around children” (77%); “keeps mosquitoes away while sleeping” (73%); “reduces malaria” (68%); “is a high quality/effective brand”(66%); “is good value for the money” (60%); and “keeps mosquitoes away for a long time” (56%). Spray/aerosol was most strongly associated with killing mosquitoes (85%) and killing other insects (84%); nets were among the lowest rated products on these attributes (15%; 5%).
- Brand awareness was highest for Target (72%) and much lower for other brands. Awareness of any brands was very low in rural areas. Target was most associated with the insect control attributes consumers value.

PROGRAM/PRODUCT IMPLICATIONS:

The overall setting for ITM promotion and sales in Zambia is favorable, with a few negative perceptions of net treatments (but not nets) to be overcome.

Favorable factors include:

- high awareness of malaria and general understanding of how it is transmitted;
- high awareness of mosquito nets as an insect control method and highly favorable attitudes toward mosquito nets compared to other insect control products;
- a net culture that is already being established (moderate level of net ownership and recent acquisition of nets);
- evidence of higher net coverage rates where they have been promoted;
- already moderate level of ITM awareness in many areas;
- strong valuing of the product attributes that ITMs deliver; and
- very high level of perceived advantages of net use by vulnerable groups and low level of perceived disadvantages.

Main barriers to overcome for ITM promotion are:

- perceived high cost of nets;
- limited access to nets;
- lack of variety in net size, shape, and color;
- concerns regarding the safety and potential adverse health effects of treated nets, particularly with regard to young children and pregnant women;
- marginal availability of insecticide treatments through commercial sector;
- lack of strong branding of nets and insecticide treatments;
- low levels of ITM awareness in some areas; inadequate net treatment practices, including lack of regular treatment and re-treatment of nets;
- inadequate use of ITMs by young children and pregnant women;
- moderate exposure to malaria prevention messages; and
- misperceptions about the causes of malaria.

SECTION 1

INTRODUCTION

1.1 BACKGROUND

The Problem of Malaria

Malaria is a growing health problem in Africa. Each year, 300-500 million people worldwide suffer from the disease, with 9 out of 10 cases occurring in sub-Saharan Africa (WHO, 1998). Malaria kills at least 1 million people each year and the vast majority of deaths occur among children less than five years of age. In Africa, one out of twenty children is likely to die of a malaria-related illness before his fifth birthday (WHO, 1999). Pregnant women are also particularly susceptible to the disease. Malaria during pregnancy causes severe anemia, miscarriages, stillbirths, and maternal deaths, and may account for up to 40% of preventable low birth weight among newborns in endemic areas (Brabin, 1991; UNICEF, 1999). Malaria places a staggering economic burden on already strained national economies and on struggling families. The disease cost sub-Saharan African nations more than 2 billion USD in 1997 (WHO, 1998) and has slowed economic growth in Africa by up to 1.3% each year (Gallup & Sachs, 2000). In addition, malaria reduces human work capacity and productivity, and affects social development indicators such as child health and school attendance (Global Forum for Health Research, 2000).

Consistent use of mosquito nets and curtains that have been treated with insecticide—insecticide treated materials, or ITMs—has been proven effective in reducing malaria. Current data indicate that ITM use can prevent 19% of child deaths from all causes, with some country-specific studies in Africa suggesting that as much as 42% of all-cause mortality among children under-five can be averted. Additionally, malaria morbidity in children under five has been shown to decrease by as much as 21-72% when ITMs are used (Lengeler, 1998).

To date, however, few families in Africa have mosquito nets and there has been little consumer marketing and distribution of ITMs in most African countries. Where they have been marketed (e.g., Tanzania and The Gambia), their supply has been limited and often donor-organized and subsidized. Currently, many households use other anti-mosquito measures such as coils and aerosol sprays to prevent nuisance biting, but the efficacy of these products in preventing malaria remains unknown.

NetMark

NetMark is a United States Agency for International Development (USAID)-funded effort to promote the use of ITMs to prevent malaria in sub-Saharan Africa through the formation of public-private partnerships. Managed and carried out by the Academy for Educational Development (AED), the NetMark partnership includes, in addition to AED, the U.S. government, The Malaria Consortium of the London School of Hygiene and Tropical Medicine & the Liverpool School of Tropical Medicine, The Johns Hopkins School of Hygiene and Public Health, and Group Africa. The primary goal of NetMark is to develop a sustainable market for ITMs, especially mosquito nets (bednets), in target countries in Africa. The main objectives of the project are to increase the proportion of households that own ITMs, increase nightly use of treated nets, especially by those most vulnerable to malaria (pregnant women and children under five years of age); and increase the proportion of net owners who regularly re-treat their nets with insecticide.

1.2 SURVEY OBJECTIVES, SAMPLE, AND IMPLEMENTATION

Objectives

As part of a comprehensive research agenda that includes both market and behavioral research, NetMark conducted a household survey in Nigeria, Zambia, Uganda, Senegal, and Mozambique to serve as an evaluation baseline. The baseline survey was to provide quantitative information useful to the public health community as well as to the private sector. Specifically, the objectives of the survey were to provide data on:

- Knowledge and beliefs about mosquitoes and malaria
- Beliefs and attitudes about use of treated and untreated mosquito nets
- Access, affordability, and ownership of mosquito nets
- Net treatment practices
- Use of nets and treated nets by vulnerable groups: children under five, pregnant women, and women of reproductive age
- Consumer preferences regarding mosquito nets
- Usage and attitudes regarding other mosquito control products

In addition, the baseline survey information will supplement the NetMark qualitative research findings to inform the development of insecticide and net products and to design regional promotional campaigns encouraging the purchase and correct use of these products.

The same instrument was used in each of the five countries in order to ensure comparability of data. This document reports on findings from Zambia. Reports on the other four countries are also available from NetMark.

Sample

This survey was conducted among 1000 Zambian households with women aged 15-49 who were mothers or guardians of children under five years of age. The sample was drawn from 5 sites: Lusaka, Kitwe, Mansa, Choma, and Kaoma. In each site, the target sample was 200: 80 respondents from the urban center, 60 from households within 100 kilometers from the urban center, and 60 from households 100-200 kilometers from the urban center. The actual sample distribution attained is shown in Table 1.

Table 1: Distribution of sample among sites

Site	Total	Urban	Rural 100 km from Urban	Rural 200 km from Urban
Lusaka	211	90	60	61
Kitwe	184	73	58	53
Mansa	200	80	60	60
Choma	200	80	60	60
Kaoma	205	81	60	64
TOTAL	1000	404	298	298

A multistage sampling procedure was used to select the respondents participating in the survey, as follows.

1- Selection of primary sampling units: Purposive sampling was used to select five sites across the country that reflected the geo-ethnic diversity of the population.¹ (See Table 2.)

2- Selection of sampling points: Within each of the five sites, 20 sampling points (villages or urban neighborhoods) were randomly selected from electoral lists using quota sampling: 8 from within the city (“urban”); 6 from within 100 kilometer radius from the city (“near rural”); and 6 from within a 100-200 kilometer radius from the city (“far rural”). This stratification scheme was designed to meet the purposes of the evaluation. Since a key objective of NetMark is to increase access to ITMs across the socio-economic spectrum, it was essential to include urban centers with the potential to be reached by product distribution systems, as well as include households located at varying distances from the urban center.

3- Selection of households: Ten interviews were conducted per sampling point, each in a different household. For each sampling point, a starting point (a fixed landmark or address) and the direction from which to start the data collection were chosen. Interviewers were instructed to go to the starting point and walk in the chosen direction until they located a residence with a qualified respondent. After a successful interview, interviewers were instructed to skip five residences (or less if residences were far apart) and seek another qualified respondent.

4- Selection of eligible respondents: An eligible respondent for the evaluation was a female 15-49 years old who was the parent or guardian of a child under five years old, i.e., aged 0-4. Females aged 15-49 were selected to maximize the sample size for calculating the proportion of females of reproductive age sleeping under a net. Similarly, only those women who had a child under five were included, to maximize the sample size for calculating the proportion of children under five sleeping under a net.

This sampling procedure was designed to meet the purposes of this study. In the interest of cross-national comparability, the procedure was standardized across all five countries surveyed. In Zambia, the sampling strategy resulted in an urban-rural breakdown that approximates the national proportions: this sample is 40% urban and 60% rural, and data from World Urbanization Prospects (United Nations, 1994) found that Zambia was 43% urban and 57% rural.

In other ways, however, the sampling procedure devised for this study may have resulted in a sample that differs from a true national random sample (which was neither desirable nor feasible in this case):

- a) Net promotion activities in or near the study sites may have resulted in net ownership rates that are higher than those that would have been obtained by a true national random sample. Two sites, Kitwe and Mansa, were purposively chosen for several reasons. Both are sites of ITM promotion: the Society for Family Health (SFH) is working in Mansa and Unicef in Kitwe. Since there are active ITM promotion projects in the country, it was important to include such sites as part of the sample, and to make internal comparisons among sites. Further, both Kitwe and Mansa are key urban centers of the country, important to monitor with regard to changes in ITM coverage and practices. Both Kitwe and Mansa, as well as the other three sites, were included in the NetMark qualitative research, meaning that both qualitative and quantitative data are available for all site.

¹ Two areas of the country were deliberately excluded from the sample. Because of insecurity in North Western province, that area was not included in the study. The eastern part of the country was also excluded, since the Society for Family Health (SFH) was conducting an extensive ITM survey in Eastern Province during the same year. The SFH study also covered Kitwe; Kitwe was, however, included as a NetMark site since it is the major industrial center of the country and key to the commercial distribution of nets and insecticide treatments.

During the course of the research it was learned that the hospital in urban Kaoma had recently started selling subsidized nets and offering treatment services. Apparently the hospital was not doing active promotion in the community, but had signs up at the hospital itself.

- b) Only households with children under five were included in the sample, and the extent to which these households differ from other households with respect to the variables measured is not known.
- c) Only women of reproductive age were selected as respondents. Responses from men or from older women may differ from those of the women in the sample.

Table 2: Study sites, location and main ethnic/language groups

Site	Province/ District	Ethnic group/language
Lusaka	Lusaka	Multi-ethnic/Bemba, Nyanja, English
Kitwe	Copperbelt	Bemba, Nyanja
Mansa	Luapula	Bemba, Nyanja
Choma	Southern	Bemba, Nyanja, Lubale, Tonga
Kaoma	Western	Bemba, Nyanja, Lozi

Implementation

The research was carried out by NetMark and the Africa offices of Research International (RI). NetMark staff developed the survey instrument (survey) based on project qualitative research and a review of existing instruments on ITMs; subsequently, the draft was reviewed by colleagues from RI as well as from collaborating institutions and countries. NetMark and RI jointly conducted nearly a week of instrument pre-testing in Zambia in September 2000. In October, RI trained local Zambian data collectors, and thereafter managed the implementation of the survey. The data were collected during October 2000.

To maximize comparability of data, the surveys were administered in all five countries (Nigeria, Senegal, Zambia, Uganda, and Mozambique) more or less simultaneously, during October and November of the year 2000. It should be noted, however, that the timing of the rainy season differs by country, and is likely to affect net use patterns. In Zambia, the timing of the study meant that the data were collected during the end of the dry season/beginning of rainy season.

1.3 ORGANIZATION OF REPORT AND TABLES

After describing the sample, this report presents findings grouped into three main areas: (1) knowledge and beliefs about mosquitoes and malaria; (2) mosquito nets; and (3) other mosquito control products. Implications of the findings are discussed in the final section.

This report attempts to present a large amount of data in a standard and accessible way. It includes a complete set of tables to serve as a data resource, and each table is accompanied by statements summarizing the main results. Each of the five country reports contains the same set of tables, for purposes of comparability.

In most of the tables in this report, data are broken down in several ways:

- By **site**: the five primary sampling areas (i.e. Lusaka, Kitwe, Mansa, Choma, and Kaoma), each of which includes both urban and rural areas
- By **location**: a refined urban-rural breakdown, which distinguishes between respondents in Lagos proper, those in the four other urban centers, those living in “near rural” areas (within 100 km from the urban center) and those living in “far rural” areas (100-200 km from the urban center).
- By **urban-rural**: all urban respondents across sites compared with all rural (both “near rural” and “far rural”) respondents across sites.

Some variables are also broken down by socio-economic status (SES). A description of the variables in the SES scale and of the procedure used to develop the scale is found in Section 2, which follows.

Results are presented in percentages, unless otherwise stated. Each table indicates whether percentages are based on the entire sample or on a sub-group. Base figures (denominators) are given as absolute numbers.

SECTION 2

CHARACTERISTICS OF RESPONDENTS AND HOUSEHOLDS

This section provides descriptive information on respondents and households in the sample. It also provides information on socio-economic status (SES) variables, which were combined to create a five-point SES scale.

The scale was calculated as follows: Categorical variables were re-coded to become pseudo-ordinal variables, and categories that were judged to be equivalent in terms of SES were combined to increase the frequency of responses. Principal component analysis was used to extract the main, single factor that accounted for the largest amount of variance in the data. Using the factor scores from the principal component analysis, respondents were divided into 10 groups based on the deciles of the factor scores. To assure adequate cell sizes, these ten groups were collapsed into a five point scale, so that each SES level has approximately 20% of the sample in it. In this scale, "1" indicates the lowest SES group and "5" indicates the highest.

2.1 CHARACTERISTICS OF RESPONDENTS

Table 3: Characteristics of respondents
Among all respondents

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Age of Respondent												
15-19	9.7	8.1	9.5	11	11.4	8.8	11.1	8.3	10.4	10.1	8.9	10.2
20-29	52.9	47.9	55	51.5	59.8	51.2	46.7	59.6	50.3	50.3	56.7	50.3
30-39	24.2	28.9	21.5	26.5	17.9	25.4	27.8	22.6	25.2	23.8	23.8	24.5
40-49	13.2	15.2	14	11	10.9	14.6	14.4	9.6	14.1	15.8	10.6	14.9
Education Level of Respondent (yrs)												
0	8.1	7.6	10.5	7.5	2.2	12.2	2.2	5.1	11.7	9.4	4.5	10.6
1-5	19.1	20.4	13	26.5	12	22.9	10	8.9	27.5	24.2	9.2	25.8
6-12	68.9	64.9	74	64	78.8	63.9	72.2	80.3	59.4	65.4	78.5	62.4
13+	3.8	7.1	2.5	2	7.1	0.5	15.6	5.7	1	1	7.9	1
Mean (among those w/schooling)	7.61	7.86	7.81	7.05	8.22	7.08	9.36	8.56	6.73	6.83	8.74	6.78
Language of Interview												
English	9.8	16.1	9.5	6.5	9.8	6.8	31.1	14.3	5.4	3	18.1	4.2
Lozi	6.2	0.5	1.5	0.5	0.5	27.3	0	7.3	5.7	7.4	5.7	6.5
Tonga	9.2	10	35.5	0	0	0	0	6.1	16.1	8.4	4.7	12.2
Bemba	35.3	11.4	7	90.5	63	8.8	16.7	39.8	37.2	34.2	34.7	35.7
Nyanja	39.5	62.1	46.5	2.5	26.6	57.1	52.2	32.5	35.6	47	36.9	41.3

2.2 CHARACTERISTICS OF HOUSEHOLDS

Table 4: Household composition

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Number of household members per household (mean)	5.85	5.92	5.93	5.9	5.58	5.9	5.79	6.06	5.72	5.79	6	5.76
Number of women of reproductive age in household per household (mean)	1.47	1.54	1.45	1.43	1.31	1.6	1.67	1.55	1.38	1.41	1.58	1.39
Number of children under age 5 per household (mean)	1.7	1.73	1.65	1.74	1.63	1.75	1.53	1.7	1.7	1.74	1.66	1.72

Table 5: Age distribution of household members

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	5853	1250	1186	1180	1027	1210	521	1902	1704	1726	2423	3430
0	3.7	3.7	2.6	4.6	4.5	3.3	3.5	3.6	3.5	4.1	3.5	3.8
1	5.4	5.3	6.1	4.6	4.8	6.4	5	5.6	5.8	5	5.5	5.4
2	5.3	5.9	5.3	5.3	4.7	5	4.8	4.8	5.1	6.1	4.8	5.6
3	5.2	4.6	5.5	5.3	5.1	5.7	3.8	4.3	5.9	6	4.2	5.9
4	5.5	5	5.1	6	6.1	5.4	4.6	6	5.8	4.9	5.7	5.3
5-14	27.9	28.8	29.5	28.1	27.9	25.5	28.6	27.6	29.1	27.2	27.8	28.1
15-49	41	42.2	40.5	40.8	40.3	40.9	46.4	43.1	38.1	39.8	43.8	39
50+	5.9	4.5	5.5	5.4	6.7	7.8	3.3	5	6.7	7	4.7	6.9

2.3 SOCIOECONOMIC CHARACTERISTICS

Table 6: SES indicators

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Employment of main wage earner												
Regular	35.2	50.7	31.5	29	51.6	14.1	76.7	51	16.4	24.8	56.7	20.6
Seasonal	16.4	18	17	11	19.6	16.6	12.2	19.1	12.1	19.1	17.6	15.6
Casual	46.6	28.4	50	59	27.2	67.3	8.9	27.4	68.8	56	23.3	62.4
Main wage earner's years of schooling												
0	6.0	5.2	6.5	5.5	1.6	10.7	3.3	2.5	9.4	7	2.7	8.2
1-5	11.6	10.4	12.5	13	4.9	16.6	4.4	8	14.8	14.4	7.2	14.6
6-12	62.8	59.2	62	65	70.7	58	51.1	65.3	61.1	65.4	62.1	63.3
13+	9.9	15.6	7	10.5	14.7	2	33.3	15.9	3	3.4	19.8	3.2
Don't know	9.7	9.5	12	6	8.2	12.7	7.8	8.3	11.7	9.7	8.2	10.7
Household items												
Electricity	23.6	30.3	19	27.5	41.3	1.5	66.7	49.7	3.7	3	53.5	3.4
A radio	50.3	59.7	42	51	62.5	37.1	76.7	68.8	33.2	39.9	70.5	36.6
A television	25.9	35.1	24.5	29	40.2	2	67.8	47.8	9.4	6.7	52.2	8.1
A telephone/cell phone	4	9.5	4.5	1	4.3	0.5	22.2	4.1	1.7	0.7	8.2	1.2
A refrigerator	11.9	19.4	12	8.5	19	1	44.4	21.3	2.7	1.3	26.5	2
A bicycle	31.1	31.8	28	41.5	21.2	32.2	14.4	30.6	30.2	37.6	27	33.9
A motorcycle	1.2	1.9	2	1.5	0	0.5	2.2	1.9	0	1.3	2	0.7
A car or truck	3.4	8.5	3.5	3	1.1	0.5	16.7	4.1	1	1	6.9	1
An animal-drawn plough	14.3	13.7	28	1	1.6	25.9	0	8.9	21.1	17.4	6.9	19.3
Windows with mosquito screens	0.9	2.4	0.5	0	1.6	0	5.6	1.3	0	0	2.2	0
Energy source for cooking												
Electricity	16.6	25.6	13.5	9	35.3	1	57.8	31.2	3.4	2	37.1	2.7
LPG/natural gas	0	0	0	0	0	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0	0	0	0	0	0
Kerosene/Paraffin	0.1	0	0.5	0	0	0	0	0	0.3	0	0	0.2
Coal/lignite	0.2	0.9	0	0	0	0	2.2	0	0	0	0.5	0
Charcoal	22.9	23.2	23.5	32	31.5	5.4	37.8	36	9.1	18.5	36.4	13.8
Firewood/straw	60.2	50.2	62.5	59	33.2	93.7	2.2	32.8	87.2	79.5	26	83.4
Dung	0	0	0	0	0	0	0	0	0	0	0	0

Table 6: SES indicators (continued)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Source of drinking water												
Piped Water												
Piped into home or plot	20.9	27.5	25	15	37.5	1	62.2	43	3.7	2.3	47.3	3
Public tap	10	18.5	4	5.5	16.3	5.9	34.4	11.5	2.3	8.7	16.6	5.5
Well water												
Well in residence/plot	11.8	9.5	6.5	15.5	6	21	1.1	10.2	13.1	15.4	8.2	14.3
Public shallow well	30.7	11.4	23.5	41.5	20.1	56.6	0	17.2	40.3	44.6	13.4	42.4
Public bore hole	15.2	26.1	22	8	9.8	9.3	2.2	9.9	21.1	18.8	8.2	20
Surface Water												
Spring	0	0	0	0	0	0	0	0	0	0	0	0
River/stream	6.2	6.2	6	6.5	6	6.3	0	3.2	9.7	7.7	2.5	8.7
Pond/lake	3.8	0.9	9	5.5	3.8	0	0	2.5	8.1	2	2	5
Tanker truck	0	0	0	0	0	0	0	0	0	0	0	0
Rainwater	0	0	0	0	0	0	0	0	0	0	0	0
Other												
Well at neighbor's plot	1.3	0	3.5	2.5	0.5	0	0	2.2	1.7	0.3	1.7	1
Neighbor's tap	0.1	0	0.5	0	0	0	0	0.3	0	0	0.2	0
Sanitation facility												
Flush toilet												
Own flush toilet	18.6	25.6	14	22.5	31.5	0.5	56.7	37.3	3.7	2.3	41.6	3
Shared flush toilet	3	1.9	1.5	2	10.3	0	4.4	8.3	0	0	7.4	0
Pit toilet/ latrine												
Traditional pit latrine	58.5	46	53	62.5	47.8	82.4	32.2	38.2	73.5	72.8	36.9	73.2
Ventilated improved pit latrine	7.6	7.1	13.5	8.5	5.4	3.4	5.6	13.1	1.7	8.4	11.4	5
No facility/bush/field	12.2	19.4	18	4.5	4.9	13.2	1.1	3.2	20.8	16.4	2.7	18.6
Main material of floor												
Natural floor												
Earth/sand	57	46.4	59.5	59	29.3	88.3	0	31.2	83.6	74.8	24.3	79.2
Dung	0.1	0	0.5	0	0	0	0	0	0.3	0	0	0.2
Rudimentary floor												
Wood planks	0.1	0	0	0	0.5	0	0	0	0	0.3	0	0.2
Palm/bamboo	0.1	0	0	0	0	0.5	0	0.3	0	0	0.2	0
Finished floor												
Parquet or polished wood	0.5	2.4	0	0	0	0	5.6	0	0	0	1.2	0
Vinyl or asphalt strips	0.9	2.4	1.5	0.5	0	0	5.6	1.3	0	0	2.2	0
Ceramic tiles	0.4	0.9	0	1	0	0	2.2	0.6	0	0	1	0
Cement	39	46.4	37	39.5	63	11.2	84.4	62.1	15.4	24.5	67.1	20
Carpet (not loose or scattered)	1.8	0.9	1.5	0	7.1	0	2.2	4.5	0.3	0.3	4	0.3

Table 7: Distribution of SES levels

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
1 (N = 200) LOW	20.0	12.3	33.5	22.5	7.1	23.9	0	8.9	34.2	23.5	6.9	28.9
2 (N = 196)	19.6	16.1	15	21.5	9.8	34.6	0	11.8	27.9	25.5	9.2	26.7
3 (N = 204)	20.4	20.9	13	16	16.3	35.1	2.2	11.8	25.2	30.2	9.7	27.7
4 (N = 200)	20.0	25.6	20.5	20	29.9	4.9	42.2	25.5	9.1	18.5	29.2	13.8
5 (N = 200) HIGH	20.0	25.1	18	20	37	1.5	55.6	42	3.7	2.3	45	3

SECTION 3

KNOWLEDGE AND BELIEFS ABOUT MALARIA AND MOSQUITOES

The study sought to find out whether respondents had heard of the English term “malaria,” what their level of knowledge about the symptoms and causes were, whether they knew which groups were most vulnerable to severe malaria, and whether they had received any information on avoiding malaria within the past year. Respondents were also asked when in the day they are most bothered by mosquitoes.

3.1 RECOGNITION OF TERM “MALARIA”

Respondents were asked whether they had heard of the English term “malaria” in order to find out the extent to which the term can be used in promotion activities. Use of a single term around which promotion activities could take place would be important in building common understanding of the term and the illness.

- Recognition of the term was extremely high: virtually all respondents (99.7%) reported having heard of the English term “malaria.”

Table 8: Recognition of English term “malaria”
Among all respondents

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Yes	99.7	100	99.5	100	100	99	100	99.7	99.7	99.7	99.8	99.7
No	0.3	0	0.5	0	0	1	0	0.3	0.3	0.3	0.2	0.3

3.2 PERCEIVED SYMPTOMS AND CAUSES OF MALARIA

Malaria can exhibit a diverse set of symptoms, but fever is common to all symptomatic cases. In order to determine the extent to which respondent perceptions of malaria coincide with the biomedical concepts of the illness, respondents were asked what the symptoms and causes of malaria were.

- The great majority of respondents mentioned fever or its manifestations: 79% mentioned fever/hot body; 47% “feeling cold/chills”; 42% “headache”; and 23% mentioned body aches/joint pain.” Other common symptoms of malaria were also mentioned: “nausea or vomiting” (53%), diarrhea (20%), weakness (17%), and loss of appetite (15%). Only 3% mentioned “convulsions/fits”, a symptom of severe malaria.
- The vast majority of respondents who had heard of malaria knew that mosquitoes cause malaria (81%). However, only 42% named *only* mosquitoes as the cause; 51% erroneously believed that there were additional causes of malaria as well, and 11% thought malaria was caused *only* by factors other than mosquitoes. The main misperceptions were that malaria is caused by “drinking dirty water” (19%); “dirty surroundings” (13%); and “getting cold” (10%).

Table 9: Perceived symptoms of malaria

Among respondents who have heard of malaria (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	997	211	199	200	184	203	90	313	297	297	403	594
Fever	78.7	78.7	81.9	70.5	84.2	78.8	84.4	80.8	76.8	76.8	81.6	76.8
Chills/shivering	46.7	43.6	33.2	59.0	57.1	41.9	50.0	43.5	46.8	49.2	44.9	48.0
Cough	9.0	7.1	14.6	10.0	6.5	6.9	6.7	7.7	9.1	11.1	7.4	10.1
Headache	42.3	39.8	40.7	40.0	46.7	44.8	42.2	38	46.1	43.1	39	44.6
Nausea or vomiting	53.1	56.9	51.8	50.5	57.1	49.3	56.7	52.7	51.5	53.9	53.6	52.7
Diarrhea	20.2	18.0	21.6	23.5	16.8	20.7	18.9	23.6	16.8	20.2	22.6	18.5
Dizziness	4.1	5.7	2.0	2.5	3.8	6.4	11.1	4.8	2.7	2.7	6.2	2.7
Loss of appetite	15.3	16.6	16.1	10.5	19.6	14.3	22.2	13.1	14.8	16.2	15.1	15.5
Body ache or joint pain	23.1	18.5	22.6	26.5	29.9	18.7	17.8	23	22.6	25.3	21.8	23.9
Pale eyes or palms	8.8	11.4	13.1	5.0	11.4	3.4	7.8	6.7	8.4	11.8	6.9	10.1
Convulsions/fits	3.4	2.8	3.5	6.0	0	4.4	1.1	2.9	3.7	4.4	2.5	4.0
Weakness	17.1	21.8	15.1	15.5	23.4	9.9	25.6	17.3	17.8	13.5	19.1	15.7
Rash	1.4	1.4	1.0	1.5	2.2	1.0	0	1.9	1	1.7	1.5	1.3
Other	8.5	8.5	10.1	2.0	14.7	7.9	4.4	10.2	8.4	8.1	8.9	8.2
Don't know	0.3	0	0.5	0	0	1	0	0.3	0.3	0.3	0.2	0.3

Table 10: Perceived causes of malaria

Among respondents who have heard of malaria (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	997	211	199	200	184	203	90	313	297	297	403	594
Mosquitoes	81.1	80.1	86.9	78	84.2	76.8	87.8	85	78.5	77.8	85.6	78.1
Being in the rain	5.9	7.6	3.5	3.5	10.3	4.9	4.4	4.8	7.1	6.4	4.7	6.7
Getting cold	9.6	6.2	7	15	4.3	15.3	11.1	5.8	9.8	13.1	6.9	11.4
Getting hot/sun overexposure	2.9	2.8	3.5	3	1.1	3.9	3.3	3.2	2.4	3	3.2	2.7
Drinking dirty water	18.5	19	16.6	20.5	17.4	18.7	18.9	19.2	19.9	16.2	19.1	18
Eating cold or dirty food	5.9	0.9	9	6	7.1	6.9	0	6.4	6.4	6.7	5	6.6
Overwork	0.7	0	0.5	0.5	0.5	2	0	1	0.3	1	0.7	0.7
God/Allah	0.2	0	0	0	0	1	0	0.3	0.3	0	0.2	0.2
Another person with malaria	0.8	0	1.5	1.5	0.5	0.5	0	0.6	0	2	0.5	1
Dirty surroundings	13.3	13.7	16.6	9.5	11.4	15.3	6.7	11.5	14.1	16.5	10.4	15.3
Standing water	6.9	6.2	9	6	7.6	5.9	8.9	6.1	5.4	8.8	6.7	7.1
Other	9.2	10.9	7.5	8	9.2	10.3	7.8	7.3	13.1	7.7	7.4	10.4
Don't know	7.6	12.3	4.5	4	8.7	8.4	5.6	5.8	10.4	7.4	5.7	8.9

Table 11: Knowledge that mosquitoes are the only cause of malaria

Among respondents who have heard of malaria

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	997	211	199	200	184	203	47	142	112	116	189	228
Mosquitoes only	41.8	42.2	49.2	41.5	43.5	33.0	52.2	45.4	37.7	39.1	46.9	38.4
Mosquitoes and other causes	39.3	37.9	37.7	36.5	40.8	43.8	35.6	39.6	40.7	38.7	38.7	39.7
Other causes only	11.2	7.6	8.5	18.0	7.1	14.8	6.7	9.3	11.1	14.8	8.7	13.0
Don't know	7.6	12.3	4.5	4.0	8.7	8.4	5.6	5.8	10.4	7.4	5.7	8.9

3.3 KNOWLEDGE OF VULNERABLE GROUPS

In order to measure knowledge of vulnerable groups—children under five and pregnant women—respondents who recognized the term malaria were shown a page with drawings of five household members: a man, a woman (not pregnant), a pregnant woman, a child of age 3, and a child of age 6. They were asked to select the person most vulnerable to a serious case of malaria and to then select, among the remaining, who else is most vulnerable.

- Over half (63%) selected the correct drawings: those of the young child and the pregnant woman.
- Knowledge of vulnerable groups was higher in urban (69%) than in rural areas (58%).
- Thirty-eight percent (38%) included in their selection a household member who was not among the most vulnerable: 30% selected the child of 6 years; 3% selected the non-pregnant woman; and 4% selected the man.

Table 12: Selection of vulnerable groups
Among respondents who have heard of malaria (two responses per person)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	997	211	199	200	184	203	90	313	297	297	403	594
Man	3.9	4.7	2	4.5	3.8	4.4	1.1	3.5	3.4	5.7	3	4.5
Woman	2.7	3.8	3.5	2.5	1.6	2	3.3	1.3	3	3.7	1.7	3.4
Pregnant women	67.2	65.9	72.4	67	65.2	65.5	67.8	74.1	57.6	69.4	72.7	63.5
Child of 6 years	29.6	28.9	24.1	30.5	33.2	31.5	26.7	23.3	39.1	27.6	24.1	33.3
Child of 3 years	93.8	91	96	93.5	94.6	94.1	95.6	95.5	94.3	90.9	95.5	92.6

Table 13: Knowledge of vulnerable groups
Among respondents who have heard of malaria

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	997	211	199	200	184	203	90	313	297	297	403	594
Knows vulnerable groups (pregnant woman and child under 5)	62.5	60.2	68.3	62	60.3	61.6	65.6	70.3	53.2	62.6	69.2	57.9
Does not know vulnerable groups	37.5	39.8	31.7	38	39.7	38.4	34.4	29.7	46.8	37.4	30.8	42.1

3.4 EXPOSURE TO INFORMATION ON AVOIDING MALARIA

In order to obtain a general idea of the extent to which people are currently being given information about preventing malaria, respondents who had heard of “malaria” were asked whether they had received any information about preventing malaria in the past year. Those who had heard something were asked where they heard it.

- Forty-two percent (42%) of the respondents who had heard about malaria reported that they had not received any information about avoiding malaria in the past 12 months.
- There was variation by site in the proportion of respondents (among those who had heard of malaria) who had not received prevention information in the past 12 months, ranging from 51% in Choma site to 33% in Kitwe site.
- Of those respondents who had heard information about avoiding malaria, the majority (62%) heard information from staff/personnel in health facilities; 23% heard information from neighbors or friends; 21% from the radio; and 15% from TV. Seventeen percent (17%) of urban residents and 12% of rural residents had heard information *only* from non-professionals (friends, neighbors or relatives), rather than from more professional and presumably more reliable sources.

- A higher percentage of urban respondents mentioned radio (31%) and TV (30%) as a source of malaria information than rural respondents (15% radio, 4% TV). Conversely, a higher percentage of rural respondents (73%) mentioned staff/personnel in health facilities as their source for malaria information than urban respondents (46%).

Table 14: Exposure to information on avoiding malaria
Among respondents who have heard of malaria

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	997	211	199	200	184	203	90	313	297	297	403	594
Yes	58.0	56.4	49.2	66.5	66.8	51.7	63.3	58.1	60.6	53.5	59.3	57.1
No	42.0	43.6	50.8	33.5	33.2	48.3	36.7	41.9	39.4	46.5	40.7	42.9

Table 15: Exposure to information on avoiding malaria, by source
Among respondents who have seen/heard information about malaria in the 12 months prior to the interview (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	578	119	98	133	123	105	57	182	180	159	239	339
Radio	21.3	26.1	10.2	19.5	32.5	15.2	26.3	31.9	15	14.5	30.5	14.7
Television	14.9	24.4	15.3	10.5	21.1	1.9	47.4	24.7	2.8	5.7	30.1	4.1
News paper/magazine	0.7	1.7	0	0.8	0.8	0	3.5	1.1	0	0	1.7	0
Staff at shop/pharmacy/market	0.3	0	0	0.8	0	1	0	0.5	0	0.6	0.4	0.3
Poster/notice at shop/pharmacy/market	1.7	1.7	1	3	1.6	1	3.5	1.1	2.2	1.3	1.7	1.8
Health staff/ personnel	61.6	40.3	61.2	78.2	56.1	71.4	15.8	55.5	72.8	72.3	46	72.6
Poster/notice at health facility	8.8	10.1	15.3	15	0	3.8	8.8	8.2	5	13.8	8.4	9.1
Church/mosque	0.3	0.8	1	0	0	0	0	0.5	0	0.6	0.4	0.3
School	1.0	2.5	1	0	0.8	1	3.5	0	0.6	1.9	0.8	1.2
Drama Group	0.5	0.8	1	0	0	1	0	0.5	0.6	0.6	0.4	0.6
Friends/Neighbors/Relatives	22.5	29.4	34.7	5.3	20.3	27.6	33.3	22	22.8	18.9	24.7	20.9
Other	0.7	0.8	0	1.5	0	1	0	0	0	2.5	0	1.2
Don't know	0.7	1.7	0	0	1.6	0	0	0	0.6	1.9	0	1.2

Table 16: Exposure to information from "non-professional" and "professional" sources
Among respondents who have heard of malaria

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far rural	Total Urban	Total Rural
BASE	578	119	98	133	123	105	57	182	180	159	239	339
"Non-professional" sources only	13.7	21	19.4	3	11.4	16.2	29.8	12.6	13.9	8.8	16.7	11.5
"Non-professional" and "professional" sources	8.8	8.4	15.3	2.3	8.9	11.4	3.5	9.3	8.9	10.1	7.9	9.4
"Professional" sources only	76.8	68.9	65.3	94.7	78.0	72.4	66.7	78.0	76.7	79.2	75.3	77.9
Don't know	.7	1.7	0	0	1.6	0	0	0	.6	1.9	0	1.2

3.5 MOSQUITO BITING PATTERNS

- When asked what time(s) of day mosquitoes bite them the most, the vast majority of respondents (91%) said at night when they are sleeping. Over half (61%) reported that mosquitoes bite them in the evening or at night before sleeping.

Table 17: Time of day when mosquitoes bother or bite the most
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Morning	1.5	3.3	1	0	2.2	1	0	1.3	1.7	2	1	1.8
Afternoon	2.0	1.4	2.5	1.5	4.3	0.5	0	1.6	0.7	4.4	1.2	2.5
Evening or night before sleeping	60.6	62.6	53.5	61.5	63	62.4	63.3	59.2	60.1	61.7	60.1	60.9
At night when you are sleeping	90.6	82	93.5	88.5	97.8	92.2	84.4	93	88.6	91.9	91.1	90.3
All day long	0.8	0.5	1	1.5	0.5	0.5	1.1	1.3	0.7	0.3	1.2	0.5
Don't know	0.6	0	1	1	0.5	0.5	0	1.3	0.3	0.3	1	0.3

SECTION 4

MOSQUITO NETS

4.1 PERCEIVED ADVANTAGES AND DISADVANTAGES OF NET USE BY VULNERABLE GROUPS

Children under five and pregnant women are most vulnerable to getting a serious case of malaria, and a key measure of the success of NetMark will be whether it achieves gains in the proportions of these vulnerable groups regularly sleeping under a treated net. All respondents, whether net owners or not, were asked what advantages and disadvantages they saw in a child under five sleeping under a net, in a child under five sleeping under a *treated* net, and in a pregnant woman sleeping under a *treated* net. NetMark qualitative research showed that perceived advantages/disadvantages for children under five and for pregnant women differed; therefore each of those groups was asked about separately. Further, questions about advantages/disadvantages of “sleeping under a net” were separated from the questions about “sleeping under a treated net” since qualitative research showed that the perceived benefits of and barriers to sleeping under a net were different from those for sleeping under an insecticide-treated net. Responses were unprompted and multiple responses were accepted.

Since many people may not have heard of sleeping under a treated net, it was necessary to introduce the concept before asking for a reaction to it. Before being asked about perceptions of sleeping under a treated net, each respondent was told that a treated net was one that had been dipped in or sprayed with insecticide. Then the questions about advantages and disadvantages were asked.

Given that perceptions may differ among those who are familiar with using nets and those who are not, in the tables that follow, the data for the “advantages and disadvantages” questions are further broken down by net owners and non-owners.

Advantages of sleeping under a mosquito net for child under five

- Almost all respondents (98%) named at least one advantage for a child under five sleeping under a mosquito net.
- The most commonly mentioned advantage of a child under five sleeping under a mosquito net was to “avoid getting bitten by mosquitoes” (87%). Other advantages frequently mentioned by respondents were to “avoid getting malaria” (using either the word “malaria” or a local term for the illness) (53%); “don’t get bothered by other insects/other pests” (24%); and “sleep better” (22%).
- There were no large differences between urban and rural respondents or net-owners and non-owners in any advantages mentioned.

Table 18: Perceived advantages of sleeping under a mosquito net for child under five
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
BASE	1000	211	200	200	184	205	90	314	298	298	404	596	265	735
Avoid getting bitten by mosquitoes	87.2	86.7	88.5	81.5	93.5	86.3	84.4	88.9	86.6	86.9	87.9	86.7	84.9	88
Avoid getting "malaria"	52.2	44.1	47.5	61.5	67.9	42	47.8	52.5	52.7	52.7	51.5	52.7	53.2	51.8
Avoid getting [local term for malaria]	0.9	0.9	1	1	0.5	1	0	1	1.3	0.7	0.7	1	0.4	1.1
Don't get bothered by other insects/pests	24.4	24.6	23	28.5	22.3	23.4	27.8	23.6	22.8	25.8	24.5	24.3	28.3	23
Sleep better	21.9	17.1	23	19	28.3	22.9	16.7	23.9	24.5	18.8	22.3	21.6	18.9	23
Warmer/gives warmth	3.4	2.8	3	5	2.7	3.4	1.1	1.9	3.4	5.7	1.7	4.5	1.9	3.9
Protects against dust/dirt	3.8	3.8	2.5	4.5	3.3	4.9	1.1	3.5	6	2.7	3	4.4	5.7	3.1
Gives privacy	0.5	0.5	0	1	0.5	0.5	0	0.6	0.7	0.3	0.5	0.5	0.4	0.5
Saves money/time because child not sick	2.8	1.4	1	7	0.5	3.9	1.1	2.9	4	2	2.5	3	2.3	3
Is an economical/lasting solution	3.1	2.8	4	0	8.2	1	4.4	1.9	2	5	2.5	3.5	4.5	2.6
Other	4.0	5.2	6	3	2.2	3.4	4.4	4.5	4.7	2.7	4.5	3.7	3.4	4.2
None	0.8	0.9	2	0.5	0.5	0	1.1	1.3	0.7	0.3	1.2	0.5	0.8	0.8
Don't know	0.7	0.5	0.5	0	0	2.4	1.1	1	0.7	0.3	1	0.5	0	1

Disadvantages of sleeping under a mosquito net for child under five

- The majority (81%) of respondents did not cite any disadvantages ("none" or "don't know any") for a child under five to sleep under a net: 69% said that there were no disadvantages for a child under five sleeping under a net; another 12% said they did not know of a disadvantage.
- Among those respondents who did cite disadvantages, the most commonly mentioned were "child may suffocate" (6%); "child may get caught/trapped" (5%); and "there is not enough air under the net" (3%).
- There were no large differences between urban and rural respondents or net-owners and non-owners in any disadvantages mentioned, although a somewhat larger proportion of net owners than non-owners feared that a young child might suffocate.

Table 19: Perceived disadvantages of sleeping under a mosquito net for child under five
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
BASE	1000	211	200	200	184	205	90	314	298	298	404	596	265	735
It is hot sleeping under a net	2.5	3.8	0.5	2.5	4.9	1	5.6	3.2	1.7	1.7	3.7	1.7	3	2.3
Mosquitoes can still bite through the net	1.8	1.9	2.5	2.5	1.1	1	2.2	2.5	1	1.7	2.5	1.3	3.4	1.2
Mosquitoes can still get in the net	1.5	1.9	2.5	2	0.5	0.5	2.2	1.9	0.3	2	2	1.2	2.3	1.2
Mosquitoes still make noise	1.2	2.8	1.5	1.5	0	0	2.2	0.3	2.3	0.7	0.7	1.5	1.1	1.2
It is difficult/ inconvenient if child has to get up in the night	2.7	7.1	1.5	2.5	1.6	0.5	12.2	1.3	1.3	2.7	3.7	2	3.4	2.4
It takes time to tuck in the net each night	0.2	0	0	0.5	0.5	0	0	0.3	0	0.3	0.2	0.2	0	0.3
There is not enough air under the net	3.1	2.4	3.5	5.5	2.7	1.5	3.3	5.1	2.3	1.7	4.7	2	5.7	2.2
Child might suffocate	5.6	5.7	4	6.5	7.6	4.4	7.8	8	2	6	7.9	4	10.6	3.8
Child may tear net	0.7	1.4	1.5	0.5	0	0	2.2	0.3	0.3	1	0.7	0.7	0.4	0.8
Child might get caught/trapped	5.3	6.6	4.5	5	4.9	5.4	8.9	5.7	2.7	6.4	6.4	4.5	5.3	5.3
Child will get used to net and won't be able to sleep w/o it	0.3	0.5	0.5	0.5	0	0	0	0	0.3	0.7	0	0.5	0	0.4
Too expensive/can't afford net	1.8	3.8	1	1	1.1	2	2.2	0.6	2.7	2	1	2.3	1.1	2
Other	1.0	2.4	0.5	0.5	1.1	0.5	1.1	0.3	2.3	0.3	0.5	1.3	1.5	0.8
None	68.9	59.7	69.5	75	67.9	72.7	54.4	66.2	74.5	70.5	63.6	72.5	64.5	70.5
Don't know	12.2	13.7	14.5	6	10.9	15.6	14.4	12.1	11.7	12.1	12.6	11.9	10.2	12.9

Advantages of sleeping under a *treated* net for child under five

- Almost all respondents (89%) named at least one advantage for a child under five sleeping under a *treated* net.
- Most advantages cited for a child under five sleeping under a *treated* net had to do with its greater efficacy: “kills mosquitoes” (41%), “better at preventing malaria (using either the term “malaria” or a local term for the illness” (35%); “repels mosquitoes away from net” (32%); and “kills/ repels other insects or pests” (30%), works better against mosquitoes (24%), and protects child more (18%). These perceived advantages were fairly equally distributed among urban/rural locations and among net owners/non-owners.
- Respondents in Mansa and Kitwe sites, where ITM promotion projects are active, were much more likely than respondents in other sites to note that treated nets are better at preventing malaria.
- There were no large differences between urban and rural respondents or net-owners and non-owners in any disadvantages mentioned.

Table 20: Perceived advantages of sleeping under a treated mosquito net for child under five
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
BASE	1000	211	200	200	184	205	90	314	298	298	404	596	265	735
Works better against mosquitoes than untreated net	23.7	27.5	22	15	31.5	22.9	31.1	26.4	16.8	25.5	27.5	21.1	24.5	23.4
Kills mosquitoes	40.8	41.2	34	41.5	46.2	41.5	46.7	36.3	44.6	39.9	38.6	42.3	41.5	40.5
Repels mosquitoes away from net	32.3	26.5	32	36.5	41.8	25.9	25.6	37.3	32.6	28.9	34.7	30.7	38.1	30.2
Kills/repels other insects/pests	29.6	28	28	34	31	27.3	32.2	30.6	29.9	27.5	30.9	28.7	33.2	28.3
Is better at preventing “malaria”	34.0	25.6	29	43.5	44.6	28.8	28.9	40.4	28.9	33.9	37.9	31.4	32.5	34.6
Is better at preventing [local term for malaria]	0.5	0.5	1	0.5	0	0.5	0	0.6	0.7	0.3	0.5	0.5	0.4	0.5
Child is more protected	17.7	12.8	13.5	22	22.8	18	14.4	19.4	17.1	17.4	18.3	17.3	15.8	18.4
Save more money/time because child is not sick	1.5	0.9	0	4.5	0	2	1.1	1.3	1.7	1.7	1.2	1.7	0.8	1.8
Other	2.0	2.8	3	2	1.6	0.5	0	1.3	3.4	2	1	2.7	2.3	1.9
None	5.0	4.3	6.5	5	6	3.4	2.2	4.8	4.4	6.7	4.2	5.5	4.9	5
Don't know	6.2	6.6	6.5	4	5.4	8.3	3.3	4.8	7.7	7	4.5	7.4	6.4	6.1

Disadvantages of sleeping under a *treated* net for child under five

- Sixty-four percent (64%) of respondents did not cite any disadvantage for a child under five sleeping under a treated mosquito net: 48% said that there were no disadvantages for a child under five sleeping under a treated net; 15% said that they did not know of a disadvantage.
- The most commonly mentioned disadvantages were concerns about safety of the chemical: “the chemical is dangerous” (13%); the “child might “chew/suck net” (10%); that it “causes irritation/cough” (10%); and even that the “chemical can kill the child” (9%).

Table 21: Perceived disadvantages of sleeping under a treated mosquito net for child under five
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
BASE	1000	211	200	200	184	205	90	314	298	298	404	596	265	735
Insecticide is not effective	0.7	1.4	1	0	1.1	0	1.1	0.3	0.7	1	0.5	0.8	0	1
Smell is bad	7.0	7.6	7.5	6	9.8	4.4	8.9	5.1	9.1	6.4	5.9	7.7	7.9	6.7
Causes irritation/cough	9.9	14.7	9	7.5	13.6	4.9	16.7	10.2	9.1	8.4	11.6	8.7	12.1	9.1
Causes other illness	8.8	7.1	12	6	14.1	5.4	7.8	10.8	6.7	9.1	10.1	7.9	10.9	8
Child might chew/suck net	10.3	8.1	10	12.5	14.7	6.8	8.9	12.4	7.7	11.1	11.6	9.4	9.8	10.5
Chemical is dangerous	13.4	10.4	14.5	12.5	15.8	14.1	8.9	16.9	10.4	14.1	15.1	12.2	15.8	12.5
Chemical can kill child	9.2	7.1	15.5	6	10.3	7.3	5.6	9.6	7.4	11.7	8.7	9.6	8.3	9.5
Treated net can't be washed	0.1	0	0	0	0	0.5	0	0.3	0	0	0.2	0	0.4	0
Treated net gets dirty	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	1.8	0.9	2	1.5	3.3	1.5	0	2.2	1.7	2	1.7	1.8	2.6	1.5
None	48.4	42.7	46	60	42.9	50.2	40	49	49	49.7	47	49.3	45.7	49.4
Don't know	15.3	16.1	12.5	9.5	16.3	22	18.9	13.4	16.8	14.8	14.6	15.8	12.8	16.2

Advantages of sleeping under a *treated* net for pregnant woman

- The vast majority of respondents (81%) named at least one advantage for a pregnant woman sleeping under a treated net.
- The most commonly mentioned advantages for a pregnant woman sleeping under a treated net had to do with its greater protective effect: “better at preventing malaria (39%)”, “the pregnant woman is more protected” (26%), with some specifically mentioning protection against miscarriage and stillbirth (10%), the net “repels mosquitoes away from the net” (26%) and “works better against mosquitoes than a net that has not been treated” (20%).
- In Kitwe and Mansa sites, where ITN promotion is taking place, a greater proportion of respondents specifically mentioned the advantage of better malaria prevention than did respondents in other sites.

Table 22: Perceived advantages of sleeping under a treated mosquito net for pregnant woman
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
BASE	1000	211	200	200	184	205	90	314	298	298	404	596	265	735
Works better against mosquitoes than untreated net	20.4	21.8	20.5	18.0	29.3	13.2	23.3	24.2	13.4	22.5	24.0	18.0	23.0	19.5
Kills mosquitoes	27.0	23.7	32.5	20.5	32.1	26.8	24.4	24.2	30.5	27.2	24.3	28.9	26.4	27.2
Repels mosquitoes away from net	26.1	19.0	26.0	32.0	37.0	18.0	18.9	29.6	23.5	27.2	27.2	25.3	32.1	23.9
Kills/repels other insects or pests	17.5	10.4	23.0	22.5	21.2	11.2	12.2	20.4	19.8	13.8	18.6	16.8	17.0	17.7
Is better at preventing “malaria”	38.9	28.9	33.5	47.5	52.2	34.1	33.3	43.3	35.2	39.6	41.1	37.4	40.0	38.5
Is better at preventing [local name for malaria]	0.2	0	0.5	0	0	0.5	0	0	0.3	0.3	0	0.3	0	0.3
Is better at preventing miscarriage/stillbirth	10.4	5.7	7.0	11.5	20.7	8.3	7.8	13.7	8.4	9.7	12.4	9.1	10.2	10.5
Pregnant woman is more protected	26.3	19.9	23.5	28.5	35.9	24.9	15.6	26.1	25.5	30.5	23.8	28	25.7	26.5
Save more money/time because pregnant woman is not sick	1.5	0.5	1	2	2.7	1.5	0	1.6	2	1.3	1.2	1.7	1.5	1.5
Other	3.6	3.3	4.0	4.0	2.2	4.4	1.1	4.5	4.7	2.3	3.7	3.5	4.2	3.4
None	9.3	11.4	10	8	6	10.7	13.3	6.7	9.1	11.1	8.2	10.1	10.9	8.7
Don't know	9.9	10.4	8	9	9.2	12.7	5.6	9.6	12.1	9.4	8.7	10.7	6	11.3

Disadvantages of sleeping under a *treated* net for pregnant woman

- Sixty percent (60%) of respondents did not cite any disadvantage of a pregnant woman sleeping under a *treated* net: 45% said that they did not see any disadvantage of a pregnant woman sleeping under a treated net; 15% said that they did not know of a disadvantage.
- The most commonly mentioned disadvantages for a pregnant woman sleeping under a *treated* net had to do with safety issues: “might make woman nauseated/vomit” (16%); “smell is bad” (14%); “causes irritation/cough” (11%); “chemical is dangerous” (10%); and “chemical can kill fetus/ cause miscarriage” (10%). These perceived disadvantages were fairly equally distributed among urban and rural locations.

Table 23: Perceived disadvantages of sleeping under a mosquito net for pregnant woman
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
BASE	1000	211	200	200	184	205	90	314	298	298	404	596	265	735
Insecticide is not effective	0.3	0	0.5	0	0.5	0.5	0	0.6	0.3	0	0.5	0.2	0.8	0.1
Smell is bad	14.1	20.4	12.5	8.0	15.8	13.7	23.3	11.8	15.8	12.1	14.4	13.9	13.6	14.3
Causes irritation/cough	10.6	16.6	13	8.5	12	2.9	20	10.2	8.7	10.1	12.4	9.4	12.5	9.9
Causes other illness	8.5	9.5	11	8.5	8.2	5.4	10.0	9.9	6.4	8.7	9.9	7.6	9.1	8.3
Might make woman nauseated/vomit	16.4	19.9	18	13.5	19	11.7	24.4	13.1	15.4	18.5	15.6	16.9	20.4	15.0
Chemical is dangerous	9.7	8.1	10.5	9.0	8.2	12.7	5.6	9.9	8.4	12.1	8.9	10.2	8.7	10.1
Chemical can kill fetus/cause miscarriage	9.5	8.5	14.0	7.0	9.2	8.8	11.1	9.6	7.4	11.1	9.9	9.2	11.7	8.7
Other	3.3	2.8	2.5	2	7.6	2	4.4	4.5	2.7	2.3	4.5	2.5	4.5	2.9
None	45.3	35.1	44	58.5	44	45.4	35.6	47.5	47.3	44	44.8	45.6	46.4	44.9
Don't know	15.0	11.4	14.5	12	19	18.5	6.7	14.3	16.1	17.1	12.6	16.6	10.6	16.6

4.2 ACCESS TO MOSQUITO NETS

Improving access to nets is a primary objective of the NetMark partnership, as access is a pre-requisite for ownership. All respondents, whether a net owner or not, were asked where the nearest place was where they could purchase a net. They were also asked what mode of transport they would take to get there, and how long it would take to get there.

- Respondents mentioned both commercial and non-commercial places for obtaining nets. The nearest places respondents reported they could buy mosquito nets were general shop (36%) and clinic/hospital (24%). Nearly half (47%) of respondents from Mansa site said that the nearest place they could obtain a net was in a clinic/hospital.
- Overall, 14% of respondents reported that mosquito nets were not available or that they did not know where to get them, with 20% of respondents in Choma site reporting so and only 5% in Mansa site.
- The majority of respondents (56%) reported they would get to the nearest place they can purchase a mosquito net by foot. The average amount of time to get there by foot was 1 hour, although the amount of time needed varied considerably (standard deviation 70 minutes), with rural dwellers needing a longer time by foot (70 min.) than urban residents (46 min.). Another 38% said they would have to take a bus to reach the nearest place, and that it would take them 75 minutes (standard deviation 82 minutes). Rural dwellers reported longer bus rides (87 min.) than urban dwellers (51 min.).

Table 24: Nearest place household can purchase mosquito nets
Among all households

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Not available	7.1	7.1	12.5	2	4.9	8.8	3.3	7.6	11.7	3	6.7	7.4
Open air/structured market	3.0	1.9	2	6.5	4.3	0.5	0	6.1	1.3	2.3	4.7	1.8
Local kiosk	0.2	0	0	0	0.5	0.5	0	0.3	0	0.3	0.2	0.2
Street/table top vendor	0.6	0.9	0.5	1	0.5	0	2.2	1	0	0.3	1.2	0.2
General shop	35.6	48.3	45.5	19.0	23.9	39.5	66.7	30.6	26.8	40.3	38.6	33.6
Textile/clothes shop/bedding shop	5.3	3.8	1.5	3	12.5	6.3	3.3	7	5.4	4	6.2	4.7
Wholesaler	8.4	7.1	13	4.5	10.3	7.3	5.6	9.2	9.1	7.7	8.4	8.4
Pharmacy/chemist	1.3	1.4	1.5	0	2.2	1.5	1.1	1.6	1.3	1	1.5	1.2
Drug store	0.3	0	0	0	0	1.5	0	1	0	0	0.7	0
Supermarket	4.8	10.9	4.5	6	0.5	1.5	10	5.1	2.3	5.4	6.2	3.9
Mini-mart	0.2	0.5	0	0	0	0.5	0	0.3	0	0.3	0.2	0.2
Project (e.g. NGO)	1.6	0.9	0	5.5	1.6	0	2.2	1.6	1	2	1.7	1.5
Clinic/hospital	23.9	10	10.5	46.5	28.3	25.4	1.1	22	33.9	22.8	17.3	28.4
Other:												
Hawkers/moving kiosk	0.6	0	0	3	0	0	0	0	2	0	0	1
Organizations	0.2	0	0	0.5	0.5	0	0	0	0	0.7	0	0.3
Retailers	0.2	0	0.5	0	0.5	0	0	0.3	0.3	0	0.2	0.2
Bought abroad	0.1	0	0.5	0	0	0	0	0.3	0	0	0.2	0
Don't know	6.6	7.1	7.5	2.5	9.2	6.8	4.4	6.1	4.7	9.7	5.7	7.2

Table 25: Mode of transport to nearest place where net purchase can be made
Among households that know of the nearest place where they can purchase a mosquito net

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	863	181	160	191	158	173	83	271	249	260	354	509
By foot/walk	55.5	18.8	53.1	90.1	50	63	15.7	79.7	54.6	43.8	64.7	49.1
By bus	38.4	76.8	27.5	6.8	50	32.4	79.5	15.5	40.2	47.3	30.5	43.8
By car	3.7	3.3	13.8	0.5	0	1.7	4.8	2.6	4.8	3.5	3.1	4.1
By boat	0	0	0	0	0	0	0	0	0	0	0	0
Other:												
By bicycle	1.4	1.1	0	2.6	0	2.9	0	2.2	0	2.3	1.7	1.2
Train	1	0	5.6	0	0	0	0	0	0.4	3.1	0	1.8

Table 26: Length of time it takes by foot to get to nearest place where net could be purchased
Among respondents who would travel by foot to get to nearest place

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	479	34	85	172	79	109	13	216	136	114	229	250
Mean number of minutes	58.47	51	77.31	45.08	32.19	85.91	20.92	47.02	76.18	63.76	45.54	70.45
Standard deviation	70.17	47.76	85.66	65.15	25.43	79.62	17.21	61.07	90.48	56.54	59.74	76.81
Median value	28.43	27.5	33.5	18.85	26.15	59.33	13.5	25.53	39.7	44.29	25.07	42.12

Table 27: Length of time it takes by bus to get to nearest place where net could be purchased
Among respondents who would travel by bus to get to nearest place

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	331	139	44	13	79	56	66	42	100	123	108	223
Mean number of minutes	75.47	53.48	88.52	69.38	57.8	146.14	32	81.24	93.81	81.92	51.15	87.25
Standard deviation	81.87	43.09	90.97	56.18	51.13	133.39	23.87	125.43	79.61	77.76	83.4	78.64
Median value	48.6	36.94	50.45	53.5	43.75	77.5	24.91	29	57.39	56.25	27.22	57.4

4.3 AFFORDABILITY OF MOSQUITO NETS

One of the objectives of NetMark is to make ITMs more affordable. Affordability is being monitored in several ways, mostly via other NetMark-sponsored studies. “Willingness to pay” information was gathered as part of market research conducted by Research International; and data on price of nets is being monitored using periodic retail audits and manufacturers’ sales data.

This household survey contains two supplementary measures of affordability. On the assumption that actual price paid is a good indicator of affordability, respondents were asked how much they paid for each net owned. Data on price of nets is found in “Characteristics of Nets Owned” (Section 4.5). Respondents from households without nets were asked why they did not own any nets. “Cost/can’t afford” is one response category, serving as a measure of the extent to which respondents perceive nets to be too expensive. Data on this question are found at the end of the next section on “Mosquito net ownership.”

4.4 MOSQUITO NET OWNERSHIP

One of the main topics of interest is net ownership or “coverage”—both the extent of coverage and pattern of coverage in terms of characteristics such as household socio-economic status and location. Respondents were asked if their household owned any mosquito nets, and, if so, how many. “Net” refers to any type or shape of net except baby nets (small umbrella-type nets that only fit an infant). Respondents from households without nets were asked why they did not own a net.

Ownership patterns

- Over one-quarter (27%) of households reported owning at least one mosquito net. This figure may be higher than the national average, given that two of the sample sites—Mansa and Kitwe—have active net promotion projects.
- Ownership of mosquito nets was highest in the Kitwe site (38%) and lowest in the Choma site (20%).
- Ownership was higher in urban areas (35%) than in rural areas (21%).
- Twenty-eight percent (28%) of net-owning households owned more than one net; 21% owned two mosquito nets and 5% owned three. A higher percentage of households in urban areas other than the capital (36%) owned two or more nets than did those in the capital (20%), in the near rural areas (26%), or in the far rural areas (13%).
- There is a direct positive linear relationship between net ownership and SES: the higher the SES, the more likely a household is to own a net.

Table 28: Household ownership of mosquito nets
Among all households

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	1000	211	200	200	184	205	90	314	298	298	404	596	200	196	204	200	200
Yes	26.5	24.6	20	29	38	22	27.8	36.9	19.1	22.5	34.9	20.8	11.5	18.4	25.5	29.5	47.5
No	73.5	75.4	80	71	62	78	72.2	63.1	80.9	77.5	65.1	79.2	88.5	81.6	74.5	70.5	52.5

Table 29: Number of mosquito nets owned
Among households owning mosquito nets

	Site					Location				Urban/Rural		Socio-Economic Status					
	Total	Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	265	52	40	58	70	45	25	116	57	67	141	124	3	36	52	59	95
1	72.1	80.8	67.5	65.5	74.3	71.1	80	63.8	73.7	82.1	66.7	78.2	73.9	88.9	75	76.3	61.1
2	21.1	11.5	22.5	31	21.4	17.8	8	29.3	22.8	10.4	25.5	16.1	26.1	5.6	21.2	15.3	29.5
3	4.5	5.8	7.5	1.7	1.4	8.9	8	4.3	1.8	6	5	4	0	5.6	1.9	5.1	6.3
4	1.1	1.9	0	1.7	0	2.2	4	1.7	0	0	2.1	0	0	0	0	1.7	2.1
5+	1.1	0	2.5	0	2.9	0	0	0.9	1.8	1.5	0.7	1.6	0	0	1.9	1.7	1.1
Mean number of nets	1.38	1.29	1.48	1.4	1.37	1.42	1.36	1.47	1.35	1.28	1.45	1.31	1.26	1.17	1.35	1.37	1.53
Standard deviation	0.75	0.67	0.85	0.62	0.85	0.75	0.81	0.74	0.79	0.71	0.75	0.75	0.45	0.51	0.81	0.81	0.8

Reasons for non-ownership

- The majority (88%) of non-net owning households reported that a reason why they don't own any mosquito nets is because they "don't have any/enough money". There is a direct linear relationship between SES and respondents' perception that they "don't have any/enough money": the higher the SES, the less likely the respondent was to state this reason for non-ownership. (At the same time it is important to note that over three-fourths (76%) of respondents in the highest SES category cited "don't have any/enough money" as a reason for non-ownership).
- A higher proportion of respondents cited this reason in rural (92%) than in urban areas (82%).
- Only 5% said that they either did not like or did not need nets.

Table 30: Reasons why households do not own any mosquito nets
Among households that do not own mosquito nets (multiple responses possible)

	Site					Location				Urban/Rural		Socio-Economic Status					
	Total	Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	735	159	160	142	114	160	65	198	241	231	263	472	177	160	152	141	105
Don't have any/enough money	88.4	75.5	89.4	93.7	93.9	91.9	66.2	87.4	91.3	92.6	82.1	91.9	92.7	94.4	89.5	84.4	76.2
Not available/don't know where to get them	4.4	5.7	5	4.2	2.6	3.8	3.1	5.6	2.9	5.2	4.9	4	4	3.1	4.6	6.4	3.8
Don't like them	0.7	1.3	0	0	1.8	0.6	1.5	1	0.4	0.4	1.1	0.4	0	0.6	0.7	0	2.9
Don't need them	5.0	10.7	3.8	1.4	3.5	5	15.4	6.1	2.9	3.5	8.4	3.2	2.3	2.5	3.9	5.7	14.3
Nets won't fit on sleeping space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other:																	
It is damaged/worn out	1.5	4.4	1.3	0.7	0	0.6	4.6	0.5	1.7	1.3	1.5	1.5	0.6	1.3	1.3	3.5	1
Use/prefer another form of protection	0.5	2.5	0	0	0	0	6.2	0	0	0	1.5	0	0	0	0	0	3.8
Plan to but haven't bought one yet	0.4	0.6	0	1.4	0	0	1.5	1	0	0	1.1	0	0	0	0	2.1	0
Not ready to buy one yet/will buy in rainy season	0.4	0.6	0	0	1.8	0	0	0.5	0.4	0.4	0.4	0.4	0.6	0.6	0	0	1
Mislaid/stolen/given away	0.3	0.6	0.6	0	0	0	1.5	0	0.4	0	0.4	0.2	0.6	0	0	0	1
Used to/not bothered by mosquito bites	0.1	0	0.6	0	0	0	0	0	0.4	0	0	0.2	0	0.6	0	0	0
Don't know	1.6	3.8	0.6	0	1.8	1.9	3.1	1	2.5	0.9	1.5	1.7	2.3	0	3.3	0.7	1.9

4.5 CHARACTERISTICS OF NETS OWNED

Respondents in net-owning households were asked, for each net owned, where the net was obtained, when the net was acquired, and what brand, size, shape, and price it was. They were also asked how often, if at all, the net was washed, since effectiveness of the treatment diminishes with washing, and frequency of washing will affect decisions about insecticide treatment formulations and decisions about educational messages.

Where nets were obtained

- Net-owning households obtained their nets from both commercial and non-commercial sources: 32% of nets were purchased in a general shop, but 16% were obtained from a clinic and 8% from a project. A higher percentage of urban households (38%) got their net from the general shop than rural households (24%). A higher proportion of nets in the Mansa and Kitwe sites than in other sites were obtained from a health facility or project.
- Overall, 6% of nets were received as a gift, but in the Lusaka site, 16% of nets were received as a gift.
- A higher proportion of nets from higher SES households were purchased from a formal commercial source (fixed store) than those from lower SES households, which were more likely to be obtained from non-commercial sources such as projects or clinics. Nets from households from the lowest SES category were most likely to be obtained as a gift.

Table 31: Place where net was obtained
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	363	67	58	81	93	64	34	169	75	85	203	160
Market	2.8	1.5	0	4.9	4.3	1.6	0	3	5.3	1.2	2.5	3.1
Kiosk	1.1	0	0	0	1.1	4.7	0	0.6	4	0	0.5	1.9
Street vendor	2.8	3	1.7	2.5	4.3	1.6	0	3.6	2.7	2.4	3	2.5
General shop	32.2	29.9	41.4	38.3	15.1	43.8	38.2	38.5	16	31.8	38.4	24.4
Textile shop	2.2	1.5	0	1.2	5.4	1.6	2.9	3	0	2.4	3	1.3
Wholesaler	5	1.5	3.4	4.9	5.4	9.4	0	5.3	5.3	5.9	4.4	5.6
Pharmacy	1.1	0	1.7	0	3.2	0	0	1.2	0	2.4	1	1.3
Drug store	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	3.9	3	10.3	3.7	0	4.7	2.9	5.3	1.3	3.5	4.9	2.5
Mini-mart	0	0	0	0	0	0	0	0	0	0	0	0
Project	8.3	9	3.4	11.1	14.0	0	0	3.6	21.3	9.4	3	15
Health facility	16.3	10.4	15.5	19.8	21.5	10.9	5.9	13	28	16.5	11.8	21.9
School	0.3	0	0	0	1.1	0	0	0	0	1.2	0	0.6
Gift	6.3	16.4	5.2	6.2	1.1	4.7	14.7	3.6	6.7	8.2	5.4	7.5
Employer	3.3	6	0	0	8.6	0	5.9	4.1	1.3	2.4	4.4	1.9
Other:												
Bought from relative/neighbor	1.4	6	0	1.2	0	0	11.8	0.6	0	0	2.5	0
Hawkers/moving kiosk	0.3	1.5	0	0	0	0	0	0	0	1.2	0	0.6
Don't know	12.4	10.4	17.2	4.9	15.1	15.6	17.6	14.8	6.7	10.6	15.3	8.8

Table 32: Type of source where net was obtained
Among total number of nets owned

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	363	67	58	81	93	64	34	169	75	85	203	160	29	42	68	80	144
Informal commercial	6.9	6.0	1.7	7.4	9.7	7.8	0	7.1	12	4.7	5.9	8.1	0	2.4	13.2	7.5	6.3
Formal commercial	44.6	35.8	56.9	48.1	29	60.9	44.1	53.3	22.7	47.1	51.7	35.6	17.2	35.7	35.3	53.8	52.1
Non-commercial	28.1	25.4	19	30.9	45.2	10.9	11.8	20.7	50.7	29.4	19.2	39.4	58.6	40.5	35.3	16.3	21.5
Gift	6.6	16.4	5.2	7.4	1.1	4.7	14.7	3.6	8	8.2	5.4	8.1	17.2	4.8	8.8	7.5	3.5
Other	1.4	6	0	1.2	0	0	11.8	0.6	0	0	2.5	0	0	0	0	0	3.5
Don't know	12.4	10.4	17.2	4.9	15.1	15.6	17.6	14.8	6.7	10.6	15.3	8.8	6.9	16.7	7.4	15	13.2

Age of nets owned

- Over one-third (36%) of nets owned by households were acquired within the past 2 years.

Table 33: Number of years households have owned their nets
Among total number of household nets

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	363	67	58	81	93	64	34	169	75	85	203	160
0-<1 year	14.9	19.4	3.4	19.8	16.1	12.5	11.8	13.6	17.3	16.5	13.3	16.9
1-<2 years	21.5	34.3	22.4	25.9	14	12.5	29.4	23.7	16	18.8	24.6	17.5
2-<3 years	20.4	17.9	27.6	18.5	22.6	15.6	17.6	21.3	20	20	20.7	20
3-<4 years	14.3	7.5	22.4	9.9	19.4	12.5	14.7	17.2	10.7	11.8	16.7	11.3
4-<5 years	9.9	7.5	12.1	8.6	10.8	10.9	14.7	7.1	13.3	10.6	8.4	11.9
5+ years	16.0	9.0	12.1	14.8	11.8	34.4	8.8	14.8	17.3	20	13.8	18.8
Don't know	3	4.5	0	2.5	5.4	1.6	2.9	2.4	5.3	2.4	2.5	3.8

Brand of nets owned

- Few respondents are aware of the brand of their net(s).
- Six percent (6%) of the nets were reported to be PowerNets, the pretreated subsidized net.
- Five percent (5%) were tailor-made (non-manufactured) nets. Tailor-made nets were most common in Mansa site (14%).

Table 34: Net brands owned
Among total number of household nets

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	363	67	58	81	93	64	34	169	75	85	203	160
PowerNet	5.8	3	5.2	8.6	7.5	3.1	0	5.9	6.7	7.1	4.9	6.9
RAID	0	0	0	0	0	0	0	0	0	0	0	0
Tailor-made (non-manufactured)	4.7	0	3.4	13.6	0	6.3	0	6.5	6.7	1.2	5.4	3.8
Other:												
Made in China/Japan/Thailand	1.7	3	0	4.9	0	0	2.9	2.4	1.3	0	2.5	0.6
Mininet	1.1	4.5	0	0	0	1.6	5.9	0.6	1.3	0	1.5	0.6
Other	2.2	6	0	4.9	0	0	2.9	0	2.7	5.9	0.5	4.4
Don't know	84.3	82.1	91.4	67.9	92.5	89.1	88.2	84.6	81.3	84.7	85.2	83.1

Size and shape of nets owned

- The most common net sizes owned were double (62%) and single (21%). Single-size nets were more common in rural areas (26%) than in urban areas (17%). Only 6% of nets in households were king size and 0.6% cot-size nets.
- Two-thirds (66%) of nets owned by households were round/conical nets and 27% were rectangular-shaped. Round/conical nets were more common in the urban areas (74%) than rural areas (55%). Rectangular nets were more common in the rural areas (36%) than urban areas (21%).

Table 35: Size of nets owned
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	363	67	58	81	93	64	34	169	75	85	203	160
Cot net	0.6	0	0	1.2	0	1.6	0	0.6	1.3	0	0.5	0.6
Single	20.7	11.9	24.1	22.2	28	14.1	17.6	16.6	28	23.5	16.7	25.6
Double	61.7	76.1	58.6	61.7	54.8	59.4	82.4	63.3	56	55.3	66.5	55.6
King	6.1	3	5.2	7.4	8.6	4.7	0	7.1	5.3	7.1	5.9	6.3
Other:												
Three quarter	8.3	6	8.6	7.4	3.2	18.8	0	8.9	6.7	11.8	7.4	9.4
Don't know	2.8	3	3.4	0	5.4	1.6	0	3.6	2.7	2.4	3	2.5

Table 36: Shape of nets owned
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	363	67	58	81	93	64	34	169	75	85	203	160
Rectangular	27.3	23.9	17.2	30.9	38.7	18.8	11.8	22.5	36	35.3	20.7	35.6
Round/conical	65.6	64.2	81	63	53.8	73.4	79.4	72.8	50.7	58.8	73.9	55
Triangle/pyramid	3.6	4.5	1.7	3.7	2.2	6.3	0	1.8	9.3	3.5	1.5	6.3
Wedge	3.6	7.5	0	2.5	5.4	1.6	8.8	3	4	2.4	3.9	3.1
Don't know	0	0	0	0	0	0	0	0	0	0	0	0

Cost of nets owned

- Respondents were asked what the cost of each net owned was. The figures obtained give a general idea of price, but it should be noted that because of potential problems with recall for older nets, and because of currency devaluations over time, these figures should be taken as very general estimates.
- Households reported paying an average of 14726 Kwacha (5.30 USD) per net (conversion based on the exchange rate for the dollar on the date of the data collection). Respondents did not know the cost for a high percentage (27%) of their nets.
- Higher SES households—those in category 4 or 5—paid more for their net(s) than did households in the lower SES categories.

Table 37: Average cost of (all) nets (Kwacha)
Among total number of nets owned

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	363	67	58	81	93	64	34	169	75	85	203	160	29	42	68	80	144
Average price	14726	15741	17583	13873	12594	16500	16305	16001	12072	13945	16046	13082	12500	11313	12715	15926	16353
Standard deviation	7118	7707	10160	5947	6045	6068	8613	5273	5965	9639	5850	8171	6053	6227	6252	8791	6247
Trade/Barter (%)	1.1	0	0	1.2	0	4.7	0	0.6	4	0	0.5	1.9	0	2.4	4.4	0	0
Free (%)	8.5	26.9	3.4	3.7	3.2	7.8	20.6	3.6	14.7	8.2	6.4	11.3	31	7.1	7.4	10	4.2
Don't know (%)	27.3	22.4	44.8	18.5	28	26.6	23.5	32	18.7	27.1	30.5	23.1	13.8	33.3	20.6	23.8	33.3

Table 38: Average cost of (all) nets (USD)
Among total number of nets owned

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	363	67	58	81	93	64	34	169	75	85	203	160	29	42	68	80	144
Average price	5.30	5.67	6.33	4.99	4.53	5.94	5.87	5.76	4.35	5.02	5.78	4.71	4.5	4.07	4.58	5.73	5.89
Standard deviation	2.56	2.77	3.66	2.14	2.18	2.18	3.1	1.9	2.15	3.47	2.11	2.94	2.18	2.24	2.25	3.16	2.25
Trade/Barter (%)	1.1	0	0	1.2	0	4.7	0	0.6	4	0	0.5	1.9	0	2.4	4.4	0	0
Free (%)	8.5	26.9	3.4	3.7	3.2	7.8	20.6	3.6	14.7	8.2	6.4	11.3	31	7.1	7.4	10	4.2
Don't know (%)	27.3	22.4	44.8	18.5	28	26.6	23.5	32	18.7	27.1	30.5	23.1	13.8	33.3	20.6	23.8	33.3

Net washing patterns

- The great majority of nets (85%) of nets had been washed at least once.
- About half (51%) of nets owned by households were reportedly washed at least once a month, with one-quarter (26%) reportedly washed at least every two weeks.

Table 39: Net ever washed
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	363	67	58	81	93	64	34	169	75	85	203	160
Yes	84.6	73.1	93.1	80.2	87.1	90.6	91.2	88.8	76	81.2	89.2	78.8
No	15.4	26.9	6.9	19.8	12.9	9.4	8.8	11.2	24	18.8	10.8	21.3

Table 40: Net washing frequency
Among nets that had been washed

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	307	49	54	65	81	58	31	150	57	69	181	126
About once a year	9.4	14.3	9.3	3.1	2.5	22.4	9.7	6.7	7.0	17.4	7.2	12.7
About every six months	10.7	6.1	9.3	7.7	22.2	3.4	3.2	13.3	15.8	4.3	11.6	9.5
About every three months	24.4	24.5	22.2	26.2	25.9	22.4	29	26	22.8	20.3	26.5	21.4
About once a month	25.7	30.6	11.1	29.2	28.4	27.6	29	24.7	31.6	21.7	25.4	26.2
About every two weeks	20.8	16.3	31.5	24.6	14.8	17.2	19.4	22	15.8	21.7	21.5	19
About once a week	4.9	4.1	13.0	4.6	2.5	1.7	3.2	5.3	1.8	7.2	5	4.8
Other:												
When it is dirty	2.0	4.1	0	1.5	1.2	3.4	6.5	1.3	1.8	1.4	2.2	1.6
Once every 2/3years	1.0	0	1.9	3.1	0	0	0	0	3.5	1.4	0	2.4
3 times a year	0.7	0	0	0	2.5	0	0	0	0	2.9	0	1.6
Other	0.3	0	1.9	0	0	0	0	0.7	0	0	0.6	0

4.6 MOSQUITO NET TREATMENT

Nets that are treated with an insecticide are much more effective against mosquito bites (and therefore malaria) than untreated nets. The insecticide kills and repels mosquitoes and other insects, even if the net is torn or is not completely tucked in. An ITN also affords some protection for others sleeping in the same room, even if they are not sleeping under the net. Nets that are “pretreated” (i.e., already have insecticide on them when purchased) are beginning to be available in some areas, but even these nets need to be treated/re-treated (“post-treated”) regularly to remain effective.

In one section of the survey, all respondents were asked if they had heard of treating nets with an insecticide. Later, respondents living in net-owning households were asked whether their nets had ever been treated. For each net treated, respondents were asked how many months it has been since the last treatment, total number of post-treatments, product used to treat the nets, place where it was obtained, and how much it cost.

- About half (51%) of all respondents had heard of treating a mosquito net with an insecticide solution. Awareness of ITNs was highest in Mansa site (78%) and lowest in Choma site (27%). Awareness of ITNs was fairly equal between urban areas (50%) and rural areas (51%). Those in the highest SES category were more aware of net treatments than those in other SES categories. Nine percent of households (9%) owned a treated mosquito net.
- A total of 35% of nets had ever been treated: 27% had been pretreated when purchased and 15% were treated/re-treated after purchase. Treated nets were more common in lower SES households.
- Over one-fourth (27%) of nets owned by households had been pretreated with insecticide before purchase. The percentage of pretreated nets was highest in the Kitwe (39%) and Mansa (36%) sites, and lowest in Kaoma site (8%). The percentage of pretreated nets was higher in rural areas (37%) than in urban areas (20%).
- Fifteen percent (15%) of nets owned by households were treated since they were purchased/acquired, with rates of post-treatment much higher in the Kitwe (24%) and Mansa (22%) sites than in the other sites. No one reported treating a net in Lusaka. Among the 55 nets that had been post-treated, the average number of post-treatments for nets that were less than 2 years old was 1-2 times. The average amount of time since last treatment was 6 months. The idea of treating nets is fairly new, and there was no distinct relationship between number of treatments and age of net.
- For half (51%) of the treated nets, respondents did not know the number of times the net was washed since it was last treated. Twenty-one percent (21%) were never washed since last treated, 16% were washed 1-2 times, 7% were washed 3-4 times, and 3% were washed 5-6 times since last treated.
- Treatment was obtained mostly from non-commercial sources: clinics (40%), projects (18%), and as gifts (11%) and from employers (6%). The main commercial source was a general shop (7%). Lower SES households were most likely to obtain the treatment from a non-commercial source such as a clinic or project. (Recall that higher SES households were much less likely to have a treated net.) Respondents were generally unaware of the product used to treat the net; 86% said they didn't know the product used. Households reported paying an average of 2661 Kwacha per insecticide treatment (about 0.96 USD), but treatment costs were much higher in the Mansa (1.31 USD) than in Kitwe (0.66 USD) sites. There are no discernable patterns regarding the relationship of treatment cost to SES, but numbers were very small and many people could not recall cost.

Table 41: Awareness of insecticide treated mosquito nets
Among all respondents

	Site					Location				Urban/Rural		Socio-Economic Status					
	Total	Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	1000	211	200	200	184	205	90	314	298	298	404	596	200	196	204	200	200
Yes	50.7	42.7	26.5	77.5	62.5	45.9	43.3	51.9	55	47.3	50	51.2	41.5	51.5	54.4	41.5	64.5
No	49.3	57.3	73.5	22.5	37.5	54.1	56.7	48.1	45	52.7	50	48.8	58.5	48.5	45.6	58.5	35.5

Table 42: Household ownership of treated (pre and/or post) mosquito nets
Among all households

	Site					Location				Urban/Rural		Socio-Economic Status					
	Total	Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	1000	211	200	200	184	205	90	314	298	298	404	596	200	196	204	200	200
Yes	9.3	6.6	6	14.5	17.4	2.9	2.2	11.5	9.4	9.1	9.4	9.2	6	10.2	10.3	7.5	12.5
No	90.7	93.4	94	85.5	82.6	97.1	97.8	88.5	90.6	90.9	90.6	90.8	94	89.8	89.7	92.5	87.5

Table 43: Nets ever treated (pre and/or post)
Among total number of nets owned

	Site					Location				Urban/Rural		Socio-Economic Status					
	Total	Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	363	67	58	81	93	64	34	169	75	85	203	160	29	42	68	80	144
Yes	34.7	23.9	37.9	43.2	47.3	14.1	8.8	32	50.7	36.5	28.1	43.1	51.7	47.6	44.1	26.2	27.8
No	65.3	76.1	62.1	56.8	52.7	85.9	91.2	68	49.3	63.5	71.9	56.9	48.3	52.4	55.9	73.8	72.2

Table 44: Ownership of pretreated mosquito nets
Among total number of nets owned

	Site					Location				Urban/Rural		
	Total	Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	363	67	58	81	93	64	34	169	75	85	203	160
Yes	27.3	23.9	22.4	35.8	38.7	7.8	8.8	21.9	45.3	29.4	19.7	36.9
No	62.5	74.6	51.7	64.2	49.5	76.6	91.2	68	44	56.5	71.9	50.6
Don't know	10.2	1.5	25.9	0	11.8	15.6	0	10.1	10.7	14.1	8.4	12.5

Table 45: Ownership of post-treated mosquito nets
Among total number of nets owned

	Site					Location				Urban/Rural		
	Total	Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	363	67	58	81	93	64	34	169	75	85	203	160
Yes	15.2	0	19	22.2	23.7	6.3	0	15.4	25.3	11.8	12.8	18.1
No	83.7	98.5	75.9	77.8	76.3	93.8	100	82.8	74.7	87.1	85.7	81.3
Don't know	1.1	1.5	5.2	0	0	0	0	1.8	0	1.2	1.5	0.6

Table 46: Treatment patterns

Among total number of nets owned

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	363	67	58	81	93	64	34	169	75	85	203	160	29	42	68	80	144
Bought untreated and never treated	65.3	76.1	62.1	56.8	52.7	85.9	91.2	68	49.3	63.5	71.9	56.9	48.3	52.4	55.9	73.8	72.2
Bought pretreated and never treated	19.6	23.9	19	21	23.7	7.8	8.8	16.6	25.3	24.7	15.3	25	37.9	33.3	22.1	10	16
Bought pretreated and post-treated	7.7	0	3.4	14.8	15.1	0	0	5.3	20	4.7	4.4	11.9	10.3	7.1	20.6	1.3	4.9
Bought untreated and post-treated	7.4	0	15.5	7.4	8.6	6.3	0	10.1	5.3	7.1	8.4	6.3	3.4	7.1	1.5	15	6.9

Table 47: Average number of months ago net was last treated

Among nets that were post- treated

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	55	0	11	18	22	4	0	26	19	10	26	29
1-2	29.1	0	0	38.9	36.4	25	0	26.9	31.6	30	26.9	31
3-4	16.4	0	18.2	22.2	13.6	0	0	26.9	10.5	0	26.9	6.9
5-6	20.0	0	18.2	5.6	22.7	75	0	19.2	21.1	20	19.2	20.7
7-8	3.6	0	9.1	5.6	0	0	0	7.7	0	0	7.7	0
9-10	1.8	0	9.1	0	0	0	0	3.8	0	0	3.8	0
11-12	23.6	0	36.4	16.7	27.3	0	0	3.8	36.8	50	3.8	41.4
13-18	3.6	0	0	11.1	0	0	0	7.7	0	0	7.7	0
Average months ago	6	0	8.1	5.5	5.68	4.75	0	5	6.47	7.6	5	6.86
Don't know/don't recall	1.8	0	9.1	0	0	0	0	3.8	0	0	3.8	0

Table 48: Average number of times net was treated since purchase by age of net

Among nets that were post- treated

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
All nets (n=55)	2.05	0	3.29	2.19	1.4	1	0	2.15	2.31	1.17	2.15	1.95
0 - <1 year (n=10)	2.0	0	0	3	1	0	0	1	3.5	1	1	2.67
1 - <2 years (n=9)	1.38	0	2	1.2	1	0	0	1.33	1.5	0	1.33	1.5
2 - <3 years (n=10)	2.29	0	3	2.33	2	0	0	3	2	1	3	1.75
3 - <4 years (n=6)	3.33	0	6	4	1.33	0	0	5.33	1.5	1	5.33	1.33
4 - <5years (n=10)	1.8	0	2	2	2	1	0	1.67	2	2	1.67	2
5+ years (n=6)	1.33	0	0	1	1.5	0	0	1	2	1	1	1.5

Table 49: Product used to treat net

Among nets that were post- treated

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	55	0	11	18	22	4	0	26	19	10	26	29
KO Tab	1.8	0	9.1	0	0	0	0	3.8	0	0	3.8	0
Powerchem	5.5	0	0	0	13.6	0	0	7.7	0	10	7.7	3.4
RAID product 1	0	0	0	0	0	0	0	0	0	0	0	0
RAID product 2	0	0	0	0	0	0	0	0	0	0	0	0
Other	7.3	0	0	22.2	0	0	0	3.8	10.5	10	3.8	10.3
Don't know	85.5	0	90.9	77.8	86.4	100	0	84.6	89.5	80	84.6	86.2

Table 50: Place where insecticide treatment was obtained
Among all nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	55	0	11	18	22	4	0	26	19	10	26	29
Market	3.6	0	0	0	9.1	0	0	7.7	0	0	7.7	0
Kiosk	0	0	0	0	0	0	0	0	0	0	0	0
Street vendor	0	0	0	0	0	0	0	0	0	0	0	0
General shop	7.3	0	0	0	0	100	0	15.4	0	0	15.4	0
Textile shop	0	0	0	0	0	0	0	0	0	0	0	0
Wholesaler	3.6	0	0	0	9.1	0	0	7.7	0	0	7.7	0
Pharmacy	1.8	0	9.1	0	0	0	0	3.8	0	0	3.8	0
Drug store	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	3.6	0	18.2	0	0	0	0	7.7	0	0	7.7	0
Mini-mart	0	0	0	0	0	0	0	0	0	0	0	0
Project	18.2	0	0	38.9	13.6	0	0	15.4	21.1	20	15.4	20.7
Clinic	40.0	0	18.2	50	50	0	0	15.4	78.9	30	15.4	62.1
School	0	0	0	0	0	0	0	0	0	0	0	0
Gift	10.9	0	54.5	0	0	0	0	7.7	0	40	7.7	13.8
Employer	5.5	0	0	0	13.6	0	0	7.7	0	10	7.7	3.4
Don't know	5.5	0	0	11.1	4.5	0	0	11.5	0	0	11.5	0

Table 51: Type of source where insecticide treatment was obtained
Among all nets that were post-treated

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	55	0	11	18	22	4	0	26	19	10	26	29	4	6	15	13	17
Informal commercial source	3.6	0	0	0	9.1	0	0	7.7	0	0	7.7	0	0	0	0	0	11.8
Formal commercial source	16.4	0	27.3	0	9.1	100	0	34.6	0	0	34.6	0	0	0	30.8	29.4	
Non-commercial source	63.6	0	18.2	88.9	77.3	0	0	38.5	100	60	38.5	86.2	100	100	86.7	38.5	41.2
Gift	10.9	0	54.5	0	0	0	0	7.7	0	40	7.7	13.8	0	0	0	30.8	11.8
Don't know	5.5	0	0	11.1	4.5	0	0	11.5	0	0	11.5	0	0	0	13.3	0	5.9

Table 52: Cost of insecticide treatment (Kwacha)
Among nets that were post-treated

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	55	0	11	18	22	4	0	26	19	10	26	29	4	6	15	13	17
Mean	2661	0	2250	3650	1846	5000	0	4550	1733	1000	4550	1611	1000	3000	1417	5500	3917
Standard deviation	2969	0	1443	4110	2145	0	0	4265	1100	500	4265	1051	0	1732	702	6608	2311
Trade/barter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Free	25.5	0	36.4	27.8	22.7	0	0	19.2	15.8	60	19.2	31	25	33.3	6.7	30.8	35.3
Don't know	23.6	0	27.3	16.7	18.2	75	0	42.3	5.3	10	42.3	6.9	0	16.7	13.3	38.5	29.4

Table 53: Cost of insecticide (USD)

Among nets that were post-treated

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	55	0	11	18	22	4	0	26	19	10	26	29	4	6	15	13	17
Average price	0.96	0	0.81	1.31	0.66	1.8	0	1.64	0.62	0.36	1.64	0.58	0.36	1.08	0.51	1.98	1.41
Standard deviation	1.07	0	0.52	1.48	0.77	0	0	1.54	0.4	0.18	1.54	0.38	0	0.62	0.25	2.38	0.83

Table 54: Number of times net washed since last (pre or post) treated

Among all treated nets

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	196	12	20	101	39	24	7	64	46	79	71	125
0	21.4	31.3	4.5	34.3	18.2	11.1	0	24.1	15.8	25.8	22.8	20.3
1-2	15.9	18.8	31.8	14.3	9.1	11.1	0	7.4	10.5	38.7	7	23.2
3-4	7.1	0	0	5.7	6.8	44.4	0	11.1	7.9	0	10.5	4.3
5-6	3.2	0	9.1	5.7	0	0	0	3.7	5.3	0	3.5	2.9
7-8	0	0	0	0	0	0	0	0	0	0	0	0
9-10	0	0	0	0	0	0	0	0	0	0	0	0
11-12	0	0	0	0	0	0	0	0	0	0	0	0
13-18	0	0	0	0	0	0	0	0	0	0	0	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0
25+	1.6	0	9.1	0	0	0	0	3.7	0	0	3.5	0
Don't know	50.8	50	45.5	40	65.9	33.3	100	50	60.5	35.5	52.6	49.3

4.7 APPROPRIATE USE

Although it is beneficial for any household member to sleep under a net, it is particularly important for those vulnerable to severe malaria—children under five and pregnant women—to do so. This section reports on “appropriate use” of nets by looking at various measures of use by households, children under five, women of reproductive age, and pregnant women. Some of the measures use the household as the denominator (unit of analysis), while others use number of individuals in the vulnerable group as the denominator. Measures have been calculated to indicate use of any net, and then, specifically, use of a treated net.

The sample was limited to women of reproductive age (WRA)—age 15 to 49—so that net use by WRA could be calculated in addition to net use by pregnant women. The greatest public health impact for women and neonates is achieved when treated nets are used from the beginning of the pregnancy; however, many women do not realize they are pregnant, or do not wish to make their pregnancy public, for several months or more. Therefore, it is advisable for all women of reproductive age to sleep under treated nets nightly.

Overall household use

There were a total of 5853 people in all households and 1578 people in net-owning households sampled.

- Among 1578 people living in net-owning households, 34% had slept under a net the prior night. This represents 9% of all people living in the households sampled.
- Children under five and women of reproductive age were most likely to sleep under a net. It was difficult to draw conclusions about pregnant women since the denominators were so small.
- Twelve percent (12%) of people in net-owning households slept under a *treated* net the prior night, representing 3% of all people living in households sampled.

Use by children under age five

There were 1,470 children under age five in all households and 367 children under age five in net-owning households. (Note that in order to be included in the sample, a child aged 0-4 had to reside in the household.)

- Among the 367 children under five in net-owning households, 48% had slept under a net the prior night. This represents 12% of all children under five in households in the sample.
- Only 16% of children under five in net-owning households had slept under a *treated* net the prior night, representing 4% of all children under five in the households sampled.
- There was a direct positive linear relationship between SES level and proportion of children under five sleeping under a net.
- In net-owning households, a higher proportion of children under 2 slept under a net than did 2, 3, and 4 year olds.
- The proportion of net-owning households where all children under five slept under a net (treated or untreated) the prior night decreased the more children the household had. In only 27% of net-owning households with three or more children, all children under five slept under a net the prior night, whereas in 53% of net-owning households with one child that child slept under a net the night prior. Similarly, in only 3% of net-owning households with three or more children, all children under five slept under a *treated* net the night prior, whereas in 18% of net-owning households with one child that child slept under a *treated* net the prior night.

Use by women of reproductive age and pregnant women

All households had at least one woman of reproductive age, since a criterion for selection was to be a WRA responsible for a child under five. The total number of women of reproductive age in the households sampled was 1,469. The number of WRA among net-owning households was 397. The total number of pregnant women in the households sampled was 74 and, of these, 17 were from net-owning households.

- Forty-two percent (42%) of WRA in net-owning households slept under a net the prior night. This represents 11% of the total sample. Only 14% of WRA in net-owning households slept under a treated net the prior night. This represents 4% of all WRA in the households sampled.
- Eighteen percent (18%) of pregnant women in net-owning households slept under a net the prior night. This represents 4% of the total sample. Only 6% of pregnant women in net-owning households slept under a treated net the prior night. This represents 1% of the total sample. (However, note the small denominators from which percentages were calculated.)
- A higher proportion of adult females (40%) than adult males (30%) slept under a net the prior night in net-owning households.
- WRA and pregnant women of higher SES status were more likely than their lower SES counterparts to sleep under a net.

General patterns

- A fairly high proportion of nets was unused the prior night; for 36% of king-sized nets, 30% of double nets, and 44% of single nets, no one slept under the net on the prior night. (Recall that the data were collected during the dry season in Zambia.)
- For nets used the prior night, the average number of people sleeping under nets of different sizes was: king (2.57), double (2.28), and single (1.95).
- The average number of months people in the household slept under mosquito nets was 8.89 per year.

Table 55: Proportions of household members who slept under a net last night
Among specific household members

	Household members in net-owning households			Household members in all households		
	Base	% sleeping under any net (n)	% sleeping under treated net (n)	Base	% sleeping under any net (n)	% sleeping under treated net (n)
ALL	1578	33.8% (534)	11.9% (188)	5853	9.1% (534)	3.2% (188)
Adults (age 15+)						
Males	330	29.7% (98)	10.6% (35)	1167	8.4% (98)	3.0% (35)
Females	423	40.4% (171)	13.2% (56)	1579	10.8% (171)	3.5% (56)
Females ages 15-49	397	42.1% (167)	13.6% (54)	1469	11.4% (167)	3.7% (54)
Pregnant women	17	17.6% (3)	5.9% (1)	74	4.1% (3)	1.4% (1)
Older children (ages 5-14)						
Males	214	16.8% (36)	7% (15)	776	4.6% (36)	1.9% (15)
Females	244	22.1% (54)	9% (22)	861	6.3% (54)	2.6% (22)
Younger children (ages 0-4)						
ALL	367	47.7% (175)	16.3% (60)	1470	11.9% (175)	4.1% (60)
Males	173	42.2% (73)	14.5% (25)	750	9.7% (73)	3.3% (25)
Females	194	52.6% (102)	18% (35)	720	14.2% (102)	4.9% (35)
Age 0 - <1	69	62.3% (43)	17.4% (12)	217	19.8% (43)	5.5% (12)
Age 1 - <2	77	61.0% (47)	16.9% (13)	318	14.8% (47)	4.1% (13)
Age 2 - <3	64	39.1% (25)	17.2% (11)	308	8.1% (25)	3.6% (11)
Age 3 - <4	70	40.0% (28)	12.9% (9)	305	9.2% (28)	3.0% (9)
Age 4 - <5	87	36.8% (32)	17.2% (15)	322	9.9% (32)	4.7% (15)

Table 56: Proportions of vulnerable groups who slept under a net last night
Among persons most vulnerable to severe malaria in net-owning households

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
Children (0-4)																	
Any net (n=175)	47.7	35.8	49.1	54.3	47.3	50	41.9	58.7	47.9	30.2	56.1	37.9	31.0	38.8	42.0	46.5	58.2
Treated net (n=60)	16.3	7.5	17.5	22.8	21.5	6.9	6.5	19.8	21.9	9.4	17.7	14.8	10.3	12.2	21.7	9.3	20.9
Females (15-49)																	
Any net(n=167)	42.1	34.6	33.3	47.4	46.7	46	38.1	52.7	38.2	26.8	50	31.8	22.6	24.6	45.2	40.9	52.7
Treated net (n=54)	13.6	3.7	18.2	18.6	18.9	6.3	4.8	18.1	13.2	9.3	15.6	11	9.7	6.6	17.7	10.8	17.3
Pregnant women																	
Any net (n=3)	17.6	0	0	20	40	0	0	25	33.3	0	25	11.1	0	12.5	0	100	20
Treated net (n=1)	5.9	0	0	0	20	0	0	0	33.3	0	0	11.1	0	12.5	0	0	0

Table 57: Proportion of net-owning households in which none, some, or all children under five slept under a net last night
Among net-owning households with children under age five

	% Sleeping under any net			% Sleeping under treated net		
	None	Some	All	None	Some	All
Number of net-owning households with 1, 2 or 3+ children under age 5						
1 (n=137)	47.4	---	52.6	81.8	---	18.2
2 (n=98)	38.8	30.6	30.6	76.5	12.2	11.2
3+ (n=30)	43.3	30.0	26.7	83.3	13.3	3.3

Table 58: Mean number of people sleeping under a net, by net size
Among household members sleeping under specific size nets

	Size of net		
	King	Double	Single
BASE	22	224	75
None (%)	36.4	29.5	44.0
Mean (excluding zero)	2.57	2.28	1.95
Standard deviation	1.22	0.84	0.82
Median value	2.50	1.73	1.41

Table 59: Number of months per year people in household sleep under a net
Among net-owning households

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	265	52	40	58	70	45	25	116	57	67	141	124
Mean number of months	6.55	6.04	6.89	7.25	6.50	6	6.28	6.96	6.41	6.03	6.84	6.21
Standard deviation	2.96	3.24	3	3.28	2.56	2.53	3.51	3.06	2.74	2.66	3.15	2.69
None	1.9	0	5	0	1.4	4.4	0	1.7	0	4.5	1.4	2.4

4.8 CONSUMER MOSQUITO NET PREFERENCES

The prior section described the characteristics of nets owned, which is to a large extent a reflection of types of nets currently available. This section reports on the characteristics of nets that consumers *prefer*. Questions on preferences were asked of all respondents, whether or not their household owned a net. The information in this section will be used to develop nets with features that consumers want.

Net shape and size preferences

- Over two-thirds (67%) of the respondents preferred round/conical nets and about one-fourth (24%) preferred rectangular nets. Fewer households preferred triangle/pyramid (6%) or wedge (3%) shaped nets (though these shapes may not be known or available).
- Consumers preferred large nets. About half of the households (51%) preferred king-size nets for their households and 35% preferred double-size nets. Only 11% preferred single-size nets and 3% cot-size nets.

Table 60: Net shape preferences
Among all respondents

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Rectangular	23.5	23.2	21	32	20.1	21	24.4	22.3	23.5	24.5	22.8	24
Round/conical	67.4	70.1	68.5	58	69.6	70.7	66.7	70.1	66.4	65.8	69.3	66.1
Triangle pyramid	5.7	3.8	6.5	6	8.2	4.4	3.3	4.5	7	6.4	4.2	6.7
Wedge	2.9	2.8	4	3	1.6	2.9	5.6	2.5	2	3.4	3.2	2.7
Other	0.2	0	0	0	0.5	0.5	0	0.6	0	0	0.5	0
No preference	0.3	0	0	1	0	0.5	0	0	1	0	0	0.5

Table 61: Net size preferences
Among all respondents

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Cot-net	3.2	2.4	3.5	2.5	4.9	2.9	3.3	2.2	3.7	3.7	2.5	3.7
Single	11.0	8.5	6	16	12.5	12.2	6.7	8.3	11.7	14.4	7.9	13.1
Double	35.0	27.5	39.5	36.5	41.8	30.7	32.2	41.4	32.9	31.2	39.4	32
King	50.5	61.1	51	45	40.8	53.2	57.8	48.1	51.3	50	50.2	50.7
Three quarter	0.3	0.5	0	0	0	1	0	0	0.3	0.7	0	0.5

Net color preferences

- Forty percent (40%) of respondents preferred white mosquito nets, but at the same time 23% said they disliked white nets.
- Over half (54%) of the households reported disliking black nets; 26% disliked dark green; 23% disliked dark blue nets; and 23% disliked white nets.

Table 62: Net color preferences
Among all respondents

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
White	39.9	44.5	44	28	36.4	45.9	64.4	47.5	29.2	35.2	51.2	32.2
Light blue	9.7	8.1	6	14.5	16.3	4.4	5.6	9.6	8.7	12.1	8.7	10.4
Dark blue	11.1	9	13	12.5	11.4	9.8	6.7	8	14.8	12.1	7.7	13.4
Light green	15.9	15.6	8	24.5	20.1	11.7	6.7	15	19.5	16.1	13.1	17.8
Dark green	6.2	4.7	3.5	8	6.5	8.3	1.1	6.1	7.7	6.4	5	7
Pink	9.4	10.9	12	7.5	6	10.2	10	7.6	9.7	10.7	8.2	10.2
Black	7.7	7.1	13	5	3.3	9.8	5.6	6.1	10.4	7.4	5.9	8.9
No preference/don't know	0.1	0	0.5	0	0	0	0	0.3	0	0	0.2	0

Table 63: Net color dislikes
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
White	22.6	20.9	24	24	19.6	24.4	10	16.6	29.9	25.5	15.1	27.7
Light blue	6.9	7.1	8.5	6	3.8	8.8	5.6	6.7	6	8.4	6.4	7.2
Dark blue	22.7	26.1	28.5	16.5	21.2	21	30	26.1	18.5	21.1	27	19.8
Light green	11.9	9.5	16.5	11	8.7	13.7	7.8	14.6	11.7	10.4	13.1	11.1
Dark green	26.4	28.4	30.5	18	27.2	27.8	28.9	29	23.2	26.2	29	24.7
Pink	15.5	12.3	15	15	14.7	20.5	12.2	14.3	15.8	17.4	13.9	16.6
Black	53.5	59.2	51.5	42	66.3	49.3	74.4	60.5	46.3	47	63.6	46.6
None/don't know	10.6	10.4	8.5	15.5	8.2	10.2	7.8	8.3	13.1	11.4	8.2	12.2

SECTION 5

OTHER MOSQUITO CONTROL PRODUCTS

In order to understand the role of nets in the larger context of mosquito control products, respondents were asked what mosquito control methods they knew of and used, what attributes of mosquito control they valued the most, and what products and brands they associated with various attributes. This information will be particularly useful for the private sector as it seeks to meet consumer needs.

5.1 AWARENESS OF MOSQUITO CONTROL PRODUCTS AND METHODS

- The commercial insect method respondents were most aware of (unprompted mention) was the mosquito net. Seventy percent (70%) mentioned sleeping under a net with 6% specifically mentioning a treated net. The next most commonly mentioned methods were mosquito coils (49%) and aerosol insecticide (43%). Few (8%) were aware of repellants.
- Mention of mosquito nets was highest in the Kitwe (92%) and lowest in Lusaka (59%) sites.
- Respondents also mentioned non-commercial methods of mosquito control: burning things (43%) and keeping surroundings clean (20%).

Table 64: Awareness of mosquito control products and methods
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
COMMERCIAL PRODUCTS												
Sleep under a mosquito net (untreated or unspecified)	64.2	52.6	55	67.5	85.9	62.4	56.7	67.8	61.7	65.1	65.3	63.4
Sleep under an insecticide-treated mosquito net	5.9	6.6	6.5	9	6.5	1	6.7	6.4	4.7	6.4	6.4	5.5
Use mosquito coils	48.8	57.8	47	29.5	56.5	53.2	61.1	54.1	40.3	48	55.7	44.1
Use aerosol insecticide	43.0	45.5	43.5	44	46.2	36.1	71.1	52.9	30.9	36.2	56.9	33.6
Use commercial mosquito repellent on body	8.4	11.4	8.5	4	14.1	4.4	15.6	10.5	6.4	6	11.6	6.2
Use flit gun/spray gun (that you fill yourself)	1.5	2.4	1	0.5	3.3	0.5	1.1	2.2	1.3	1	2	1.2
Have mosquito screens/nets in windows/doors	0.1	0.5	0	0	0	0	0	0	0.3	0	0	0.2
Other	0.4	0.5	0.5	0	1.1	0	0	0.6	0.3	0.3	0.5	0.3
NON-COMMERCIAL METHODS												
Close windows and doors	7.3	8.5	8	5.5	9.2	5.4	13.3	4.8	7.7	7.7	6.7	7.7
Burn things	43.1	42.2	48	40.5	38	46.3	14.4	31.2	51.3	56	27.5	53.7
Keep surroundings clean	19.9	19.9	25.5	12.5	31.5	11.2	21.1	16.9	23.2	19.5	17.8	21.3
Other non-commercial method	6.5	2.8	11.5	5	8.7	4.9	2.2	6.1	8.7	6	5.2	7.4

5.2 USE OF COMMERCIAL MOSQUITO CONTROL PRODUCTS

If a respondent was aware of a given mosquito control method, she was asked whether she had used that method in the prior year. Note that these figures may be somewhat lower than actual use, given that “use” was asked only of those who indicated that they were aware of a given product, and level of use was calculated using total number of respondents as the base. Note also that use of nets is covered in Section 4.

- Use of commercial mosquito control products appears to be low: the products respondents most often reported having used in the last 12 months were mosquito coils (29%) and aerosol insecticide (20%). Virtually no other commercial product was used. (See Section 4 for data on net use.)
- A higher percentage of urban than rural respondents used all types of commercial insect control methods.

Table 65: Use of commercial mosquito control products
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Use mosquito coils	29.1	36	28	19.5	34.2	27.8	32.2	36	21.5	28.5	35.1	25
Use aerosol insecticide	19.6	28.4	18.5	23.5	17.9	9.3	48.9	28	9.4	12.1	32.7	10.7
Use commercial mosquito repellent on body	2.8	3.8	2.5	1	5.4	1.5	4.4	4.5	1	2.3	4.5	1.7
Use flit gun/spray gun (that you fill yourself)	0.4	0.5	0.5	0.5	0.5	0	0	0.6	0.3	0.3	0.5	0.3
Have mosquito screens/nets in windows/doors	0	0	0	0	0	0	0	0	0	0	0	0
Other commercial method	0.1	0.5	0	0	0	0	0	0	0.3	0	0	0.2

5.3 FREQUENCY, LOCATION, AND PRICE OF COIL, INSECTICIDE AEROSOL, AND REPELLANT PURCHASES

Coils

- Coils were purchased fairly frequently. Of the 29% of households that had purchased mosquito coils in the last 12 months, about one-quarter (26%) had bought them within the last week. Frequency of purchase was higher in urban than rural areas: 37% of urban coil users had purchased a coil within the prior week, compared with 15% of rural users.
- The average reported price paid for a single mosquito coil was 0.17 USD, but the price range was large, with a standard deviation of .22. The average reported price was higher in rural (0.20 USD) than in urban areas (0.14 USD).
- Of the 29% of households that had purchased coils in the last 12 months, 25% purchased them in a kiosk, 24% in a market, and 22% in a general shop; 9%, however, did not know or could not recall the site of purchase.

Table 66: Frequency of mosquito coil purchase
Among households that used mosquito coils in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	291	76	56	39	63	57	29	113	64	85	142	149
Today or yesterday	10.0	6.6	16.1	7.7	15.9	3.5	13.8	16.8	3.1	4.7	16.2	4.0
Within the last 7 days	16.2	15.8	19.6	28.2	17.5	3.5	24.1	20.4	9.4	12.9	21.1	11.4
Within the last month	15.5	7.9	17.9	23.1	27.0	5.3	10.3	19.5	17.2	10.6	17.6	13.4
Within the last 3 months	9.3	10.5	7.1	12.8	9.5	7.0	13.8	6.2	9.4	11.8	7.7	10.7
More than 3 months ago	44.3	51.3	35.7	28.2	28.6	71.9	20.7	33.6	56.3	57.6	31.0	57.0
Don't know/can't recall	4.8	7.9	3.6	0	1.6	8.8	17.2	3.5	4.7	2.4	6.3	3.4

Table 67: Average price of single mosquito coil (USD)
Among households that purchased a single mosquito coils in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	116	36	18	20	18	24	15	48	26	27	63	53
Average price	0.17	0.22	0.15	0.14	0.09	0.18	0.19	0.13	0.21	0.19	0.14	0.20
Standard deviation	0.22	0.33	0.15	0.13	0.08	0.2	0.32	0.15	0.27	0.22	0.21	0.24
Median	0.09	0.08	0.08	0.09	0.06	0.1	0.06	0.08	0.1	0.07	0.08	0.1
Don't know (%)	10.0	2.6	8.7	5	26.1	11.5	0	13.5	13.3	6.1	10.4	9.5

Table 68: Place where mosquito coils were purchased
Among households that used mosquito coils in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	291	76	56	39	63	57	29	113	64	85	142	149
Market	23.7	21.1	23.2	33.3	33.3	10.5	13.8	27.4	12.5	30.6	24.6	22.8
Kiosk	25.4	28.9	19.6	25.6	25.4	26.3	34.5	23.9	31.3	20	26.1	24.8
Street vendor	6.2	3.9	8.9	7.7	3.2	8.8	6.9	6.2	3.1	8.2	6.3	6
General shop	21.6	27.6	19.6	12.8	11.1	33.3	24.1	19.5	23.4	22.4	20.4	22.8
Wholesaler	2.4	1.3	7.1	0	1.6	1.8	0	4.4	3.1	0	3.5	1.3
Pharmacy	1.4	1.3	1.8	0	3.2	0	3.4	1.8	0	1.2	2.1	0.7
Drugstore	0.7	1.3	0	0	1.6	0	3.4	0.9	0	0	1.4	0
Supermarket	6.5	5.3	10.7	7.7	6.3	3.5	6.9	6.2	4.7	8.2	6.3	6.7
Mini-mart	2.1	3.9	1.8	0	1.6	1.8	3.4	1.8	3.1	1.2	2.1	2
Hawkers/moving kiosk	0.3	0	0	2.6	0	0	0	0	0	1.2	0	0.7
Other	0.7	1.3	0	2.6	0	0	0	0	3.1	0	0	1.3
Don't know	8.9	3.9	7.1	7.7	12.7	14	3.4	8	15.6	7.1	7	10.7

Aerosols

- Of the 20% of households that had purchased aerosols in the last 12 months, 62% had purchased them within the last three months and 35% had purchased them more than three months ago.
- The average reported price was 1.29 USD for a 180-220 ml can of aerosol insecticide and 1.64 USD for a 300-350 ml can.
- Supermarkets and general shops were the most common source of aerosol insecticide: 43% of the households that had purchased aerosol insecticide in the last 12 months purchased it in a supermarket and 17% purchased from a general shop. A higher proportion of urban households (55%) than rural households (22%) purchased their aerosol in a supermarket. A higher proportion of rural households (23%) than urban households (14%) purchased the aerosol in a general shop.
- Aerosols were not commonly purchased from less formal outlets such as markets or kiosks.

Table 69: Frequency of aerosol insecticide purchase
Among households that used aerosol insecticides in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	196	60	37	47	33	19	44	88	28	36	132	64
Today or yesterday	2.6	1.7	2.7	0	9.1	0	2.3	2.3	3.6	2.8	2.3	3.1
Within the last 7 days	10.7	10.0	10.8	17.0	9.1	0	13.6	17.0	0	0	15.9	0
Within the last month	27.0	26.7	18.9	29.8	33.3	26.3	29.5	28.4	28.6	19.4	28.8	23.4
Within the last 3 months	21.9	23.3	16.2	25.5	24.2	15.8	25	23.9	14.3	19.4	24.2	17.2
More than 3 months ago	35.2	33.3	51.4	27.7	21.2	52.6	22.7	26.1	53.6	58.3	25	56.3
Don't know/can't recall	2.6	5	0	0	3	5.3	6.8	2.3	0	0	3.8	0

Table 70: Average price of 180-220 ml can of aerosol insecticide
Among households that bought a 180-200 ml can of aerosol insecticide

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	105	27	21	32	18	7	23	52	14	16	75	30
Average price	1.29	1.26	1.43	1.30	1.25	0.99	1.26	1.28	1.31	1.33	1.28	1.32
Standard deviation	0.40	0.35	0.48	0.43	0.18	0.36	0.36	0.43	0.40	0.40	0.41	0.39
Median	1.24	1.19	1.24	1.25	1.2	1.17	1.19	1.24	1.16	1.17	1.24	1.19
Don't know (%)	32.40	29.6	23.8	34.4	50	14.3	21.7	30.8	50	37.5	28	43.3

Table 71: Average price paid of 300-350 ml can of aerosol insecticide
Among households that bought a 300-350 ml can of aerosol insecticide

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	83	32	15	15	11	10	20	33	14	16	53	30
Average price	1.64	1.75	1.55	1.48	1.79	1.42	1.84	1.62	1.75	1.21	1.71	1.5
Standard deviation	0.45	0.48	0.42	0.42	0.48	0.3	0.29	0.42	0.45	0.53	0.38	0.55
Median	1.61	1.74	1.38	1.32	1.73	1.25	1.75	1.51	1.75	1.17	1.67	1.54
Don't know (%)	33.7	28.1	46.7	26.7	36.4	40	25	36.4	28.6	43.8	32.1	36.7

Table 72: Place where aerosol insecticides were purchased
Among households that used aerosol insecticides in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	196	60	37	47	33	19	44	88	28	36	132	64
Market	7.7	5	24.3	2.1	3	5.3	2.3	11.4	0	11.1	8.3	6.3
Kiosk	6.6	3.3	0	12.8	6.1	15.8	2.3	6.8	14.3	5.6	5.3	9.4
Street vendor	1.0	0	5.4	0	0	0	0	1.1	0	2.8	0.8	1.6
General shop	17.3	16.7	27	10.6	6.1	36.8	13.6	14.8	17.9	27.8	14.4	23.4
Wholesaler	3.1	3.3	5.4	0	3	5.3	2.3	3.4	7.1	0	3	3.1
Pharmacy	3.6	5	5.4	0	6.1	0	0	1.1	10.7	8.3	0.8	9.4
Drugstore	1.0	1.7	0	0	0	5.3	2.3	1.1	0	0	1.5	0
Supermarket	43.9	53.3	21.6	63.8	39.4	15.8	65.9	48.9	25	19.4	54.5	21.9
Mini-mart	3.1	3.3	5.4	2.1	3	0	2.3	1.1	3.6	8.3	1.5	6.3
Other	1.5	0	0	0	9.1	0	0	1.1	3.6	2.8	0.8	3.1
Don't know	11.2	8.3	5.4	8.5	24.2	15.8	9.1	9.1	17.9	13.9	9.1	15.6

Repellants

- Repellants were not commonly purchased or used by respondents. Of the 3% of households that had purchased repellants in the last 12 months, 57% had purchased them more than 3 months ago and another 14% could not recall when the purchase had been made.
- Too few respondents purchased repellants and recalled price to enable tabulation of reliable price data for this product.
- Repellants tended to be purchased from more formal outlets: 39% of households that bought repellants in the last 12 months did so in supermarkets; 11% bought them in general shops; 11% at wholesalers; and 11% at pharmacies.

Table 73: Frequency of insect repellent purchase

Among households that used insect repellants in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	28	8	5	2	10	3	4	14	3	7	18	10
Today or yesterday	3.6	0	0	0	10	0	0	7.1	0	0	5.6	0
Within the last 7 days	0	0	0	0	0	0	0	0	0	0	0	0
Within the last month	10.7	0	20	0	20	0	0	14.3	33.3	0	11.1	10
Within the last 3 months	14.3	12.5	0	50	10	33.3	0	7.1	33.3	28.6	5.6	30
More than 3 months ago	57.1	75	60	50	50	33.3	100	64.3	33.3	28.6	72.2	30
Don't know/can't recall	14.3	12.5	20	0	10	33.3	0	7.1	0	42.9	5.6	30

Table 74: Place where insect repellants were purchased

Among households that used insect repellants in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	28	8	5	2	10	3	4	14	3	7	18	10
Market	0	0	0	0	0	0	0	0	0	0	0	0
Kiosk	0	0	0	0	0	0	0	0	0	0	0	0
Street vendor	3.6	0	0	50	0	0	0	0	0	14.3	0	10
General shop	10.7	12.5	20	0	0	33.3	25	7.1	0	14.3	11.1	10
Wholesaler	10.7	12.5	0	0	20	0	25	7.1	33.3	0	11.1	10
Pharmacy	10.7	0	20	0	0	66.7	0	14.3	33.3	0	11.1	10
Drugstore	3.6	0	0	0	10	0	0	7.1	0	0	5.6	0
Supermarket	39.3	25	60	50	50	0	25	50.0	33.3	28.6	44.4	30
Mini-mart	0	0	0	0	0	0	0	0	0	0	0	0
Don't know	21.4	50	0	0	20	0	25	14.3	0	42.9	16.7	30

5.4 PERCEPTIONS OF MOSQUITO CONTROL ATTRIBUTES, PRODUCTS, AND BRANDS

Valued attributes of mosquito control products

Respondents were read a list of attributes of mosquito control products and asked to rate, on a scale of 1-7, how important to them various attributes were.

- All attributes named were considered fairly important. The two most highly rated attributes were “kills mosquitoes” (6.38) and “reduces malaria” (6.31).

Table 75: Mean rating of mosquito control product attributes
Among all households

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Kills mosquitoes	6.38	6.44	6.08	6.55	6.65	6.22	6.61	6.32	6.42	6.34	6.39	6.38
Keeps mosquitoes away for a long time	5.86	5.60	5.80	6.18	6.04	5.74	5.72	5.83	5.82	5.99	5.80	5.90
Keeps mosquitoes away while sleeping	5.79	5.48	5.86	6.11	5.92	5.63	5.71	5.74	5.81	5.86	5.73	5.83
Kills other insects, other than mosquitoes	5.51	5.29	5.47	5.82	5.95	5.10	5.56	5.4	5.47	5.66	5.44	5.57
Is safe to use around children	6.00	5.93	5.95	6.13	6.11	5.90	6.09	5.98	6.04	5.95	6.00	6.00
Is a good value for the money	5.66	5.65	5.61	5.99	5.73	5.31	5.92	5.58	5.56	5.75	5.66	5.65
Is a long-term solution to mosquito problems	6.05	6.00	5.94	6.17	6.28	5.86	5.97	5.95	6.13	6.08	5.96	6.11
Is a high quality and effective brand	6.06	6.12	5.94	6.12	6.56	5.60	6.47	5.97	6.15	5.93	6.08	6.04
Reduces malaria	6.31	6.23	6.28	6.36	6.63	6.11	6.21	6.23	6.45	6.3	6.22	6.37

Association of attributes with mosquito control products

Respondents were read a list of attributes and asked which type(s) of mosquito control product they thought of when they heard each attribute. They could indicate more than one product. (Note that the base is respondents who were aware of a given product when prompted, and the table indicates the percentage of those respondents selecting a given product when a particular attribute was named.)

- Ratings for mosquito nets far exceeded all other products on almost all attributes: “keeps mosquitoes away for a long time”, “keeps mosquitoes away while sleeping”, “is safe to use around children”, “is good value for the money”, “is a long terms solution to mosquito problems”, “is a high quality/effective brand”, and “reduces malaria.”
- Spray/aerosol was the product most strongly associated with killing mosquitoes (85%) and killing other insects (84%); the mosquito net was among the lowest rated products on these attributes (15%; 5%).

Table 76: Association of mosquito control products and attributes
Among respondents who are aware of specific mosquito control products

	Mosquito Coil	Sprays/Aerosol	Repellant	Mosquito Net	Window/Door Screens	None	Don't Know
BASE	816	763	352	928	292	1000	1000
Kills mosquitoes	37.1	84.5	23	15.3	3.1	7	2.3
Keeps mosquitoes away for a long time	37.5	23.2	22.7	56.1	27.4	3.1	3.8
Keeps mosquitoes away while sleeping	30.4	16.9	27.8	73.3	19.2	1.1	2
Kills other insects, other than mosquitoes	13.5	83.6	11.1	5.2	4.5	12	7.5
Is safe to use around children	11.5	14.8	29	76.9	25.7	3.5	5
Is a good value for the money	28.1	21.5	15.9	60.3	11	4.6	6.2
Is a long-term solution to mosquito problems	5.4	15.1	8.8	78.9	31.2	5.6	5.6
Is a high quality/effective brand	11.2	39.7	20.5	66.1	15.1	3.9	5.9
Reduces malaria	20.1	36.8	31.3	67.5	25.3	7.3	12

Awareness of mosquito control brands

Respondents were asked to name the brands of mosquito control products they were aware of, even if they did not use them. After providing their responses, they were shown a card with the name and logo of different brands and were asked to indicate which other brand names, apart from the ones they already mentioned, they were aware of. The following tables show respondent awareness of brands by unprompted, prompted, and total awareness.

- Spontaneous (unprompted) awareness was highest by far for Target. However level of awareness of Target was still only 35% overall, though it reached 49% in urban areas, with particularly high recognition in Lusaka itself.
- Brand awareness of any type was very low in rural areas.
- Another 37% recognized Target when prompted, and another 31% recognized Ridsect and 23% recognized Doom.
- Total awareness, as calculated by the addition of unprompted and prompted responses, was highest for Target (72%). Ridsect and Doom came in second at 37% and 33% respectively. Awareness of other brands was much lower.

Table 77: Awareness of mosquito control product brand names, unprompted
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Baygon	2.1	4.3	3	0.5	2.7	0	7.8	2.9	1.7	0	4.0	0.8
Doom	9.7	19.9	7.5	6.5	12.5	2.0	37.8	10.2	6.4	4	16.3	5.2
Peaceful Sleep	0.8	1.4	0	0	2.2	0.5	1.1	1.0	1.0	0.3	1.0	0.7
Ridsect	6.6	11.4	3.0	7.5	8.7	2.4	18.9	9.2	4.4	2.3	11.4	3.4
Target	34.9	47.9	38	25.5	48.4	15.6	67.8	43.3	20.5	30.5	48.8	25.5
Other	4.8	8.1	3.5	4.5	3.8	3.9	7.8	4.5	2	7	5.2	4.5

Table 78: Awareness of mosquito control product brand names, prompted
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Baygon	16.6	23.7	11.5	15	26.1	7.3	38.9	22.9	9.4	10.4	26.5	9.9
Doom	23.1	26.5	26.0	18.5	26.6	18.0	31.1	28.0	16.4	22.1	28.7	19.3
Peaceful Sleep	11.1	15.6	8.5	10.5	13.6	7.3	21.1	12.1	7.7	10.4	14.1	9.1
Raid	4.2	5.2	3.0	2.5	9.2	1.5	5.6	5.4	4.4	2.3	5.4	3.4
Ridsect	30.8	29.9	29.0	32.0	41.3	22.9	43.3	40.4	22.8	24.8	41.1	23.8
Target	37.3	39.8	34.5	31.0	38.6	42.4	24.4	35.4	40.6	39.9	32.9	40.3

Table 79: Awareness of mosquito control product brand names, total
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Lusaka	Choma	Mansa	Kitwe	Kaoma	Lusaka Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	211	200	200	184	205	90	314	298	298	404	596
Baygon	18.7	28.0	14.5	15.5	28.8	7.3	46.7	25.8	11.1	10.4	30.4	10.7
Doom	32.8	46.4	33.5	25	39.1	20.0	68.9	38.2	22.8	26.2	45.0	24.5
Peaceful Sleep	11.9	17.1	8.5	10.5	15.8	7.8	22.2	13.1	8.7	10.7	15.1	9.7
Raid	4.2	5.2	3.0	2.5	9.2	1.5	5.6	5.4	4.4	2.3	5.4	3.4
Ridsect	37.4	41.2	32.0	39.5	50.0	25.4	62.2	49.7	27.2	27.2	52.5	27.2
Target	72.2	87.7	72.5	56.5	87.0	58.0	92.2	78.7	61.1	70.5	81.7	65.8

Mosquito control brand name associations

Respondents were read a series of attributes and asked to indicate which brand(s) they associated with the attribute. The following table provides attributes by total (sum of unprompted and prompted) awareness.

- Target, the most commonly recognized brand, had the highest ratings for all attributes. It was especially highly associated with “kills mosquitoes” and “kills other insects, other than mosquitoes.”
- Twenty-four percent (24%) of respondents associated none of the brands with “long-lasting solution” and 23% associated none with “safe to use around children.”

Table 80: Mosquito control product attribute and brand name association, total

Among respondents who were aware (spontaneous and prompted) of specific mosquito control product brand names

	Baygon	Doom	Peaceful Sleep	Raid	Ridsect	Target	None	Don't know
BASE	187	328	119	42	374	722	1000	1000
Kills mosquitoes	43.9	54	35.3	42.9	58.8	76.9	3.1	5.5
Keeps mosquitoes away for a long time	19.8	29.6	42.9	19.0	31.8	47.1	14.4	12.1
Keeps mosquitoes away while sleeping	18.2	31.7	42.0	16.7	34.5	53.6	11.2	11.7
Kills other insects, other than mosquitoes	41.2	50.6	11.8	26.2	54.3	70.9	4.9	6.5
Is safe to use around children	12.3	22.6	42.9	9.5	19.8	38.8	22.7	15.6
Is a good value for the money	18.7	30.5	27.7	19.0	26.2	52.4	10.0	16.5
Is a long-term solution to mosquito problems	13.9	19.2	20.2	23.8	18.2	33.8	24.2	17.7
Is a high quality/effective brand	22.5	36.3	27.7	21.4	31.0	62.0	5.9	11.4
Reduces malaria	33.7	34.8	40.3	35.7	43.3	54.6	11.3	16.9

SECTION 6

PROGRAM/PRODUCT IMPLICATIONS

6.1 GENERAL

There are many very favorable aspects for ITM promotion in Zambia, as well as some barriers to be overcome.

The favorable factors for ITM promotion and sales are:

- High awareness of malaria and general understanding that mosquitoes cause malaria
- Nets viewed extremely positively — more positively than any other insect control product (except that aerosols perceived as doing a better job of killing mosquitoes and other insects)
- A “net culture” is already being established; over one-fourth of all households already own at least one net and over one-third of nets were acquired in the last two years
- Evidence of higher net coverage rates where they have been promoted
- Already moderate level of ITM awareness
- Strong valuing of the product attributes that *insecticide treated nets* deliver (e.g., killing mosquitoes; killing other insects other than mosquitoes)
- High level of perceived advantages and low level of perceived disadvantages of nightly use of treated nets by vulnerable groups
- A non-specialized insect control product market — nets and other insect control products are already sold in the same outlets

Important barriers to overcome for ITM promotion and sales are:

- Cost of nets and perception that they are not affordable
- Limited access to nets (time to nearest purchase site is long)
- Fairly large proportion of nets are being provided by public sector and through the commercial sector on a subsidized basis — people are used to getting nets for little or no money
- Lack of variety in net size, color, and shape among available nets
- Concerns about safety and potential adverse health effects of insecticide treatments, particularly with regard to young children and pregnant women
- Inadequate levels of ITM use by children under five, women of reproductive age, and pregnant women
- Marginal availability of insecticide treatments through commercial sector
- Low rates of net treatment/re-treatment
- Erroneous beliefs about non-mosquito related causes of malaria; inadequate levels of knowledge of groups most vulnerable to severe malaria

The majority of findings from this baseline study are consistent with results of NetMark’s formative qualitative research in Zambia. The qualitative research report, “NetMark Formative Qualitative Research in Zambia” contains more detailed information on a number of topics discussed here and is available from NetMark.

Specific program and product implications from the baseline study presented in this report are outlined below.

6.2 KNOWLEDGE AND BELIEFS ABOUT MALARIA AND MOSQUITOES

- Recognition of the English term “malaria” was very high, demonstrating that the term can be used in health promotion activities and will be widely understood. Use of a single term around which educational efforts can build a common understanding will be very important in efforts to promote behavior change. Symptoms associated with “malaria” were generally consonant with the biomedical definition of the term, indicating that identification of the illness is already good, and little time needs to be spent on educating people to recognize simple malaria. However, few people mentioned convulsions, a symptom of severe malaria; it will be important to link convulsions to malaria in public education efforts.
- Despite the fact that a high percentage of respondents knew that mosquitoes cause malaria, many people erroneously believed that there were other causes of malaria as well, especially drinking dirty water, getting cold, living in dirty surroundings or around standing water. Malaria prevention efforts should emphasize that mosquitoes are the *only* cause of malaria, dispel erroneous beliefs about other causes, and stress that environmental efforts (such as reducing amounts of standing water) can help reduce nuisance biting by mosquitoes that do not carry the malaria parasite but do not reduce malaria. It would also be important to point out that night-biting mosquitoes are the ones that transmit malaria.
- Knowledge of the groups most vulnerable to severe cases of malaria was moderate. Efforts to promote ITM acquisition and proper use can build on the existing perception that children are particularly vulnerable, but must emphasize the special vulnerability of children *under five* and pregnant women to suffering severe consequences of malaria.
- Exposure to information about malaria prevention was moderate. Information was being transmitted largely through health facilities, social networks, and through mass media (radio and TV) and is not reaching all provinces equally. The extent to which information from friends and neighbors is accurate is not known. Increased exposure to accurate malaria prevention messages is needed, particularly in the South and West. A coordinated strategy that provides information from a variety of media and interpersonal sources is likely to be effective.

6.3 MOSQUITO NETS

Perceived advantages and disadvantages of treated/untreated net use by vulnerable groups

- A high proportion of respondents perceived advantages of net use by vulnerable groups — children under five and pregnant women. Promotional efforts designed to achieve nightly or year round net use by these groups can build on respondents’ perceptions that nets provide good protection against mosquitoes, other insects, and malaria.
- *Treated* nets were seen as especially effective in providing good protection against mosquitoes and malaria, with the added advantage of killing and repelling mosquitoes. Treated nets should be marketed as having these added advantages that consumers already like, as this will be a likely motivator to their use. Since net treatments are not visible, and people do not expect nets to have insecticide properties, it will be important to find strategies for product trials—possibly among opinion leaders—so that consumers see that treated nets deliver what they most want in a mosquito control product.
- Few respondents cited any disadvantages of a child under five sleeping under a net, but among those who did, the main disadvantages were that the child might get caught/trapped or suffocate. These perceived disadvantages should be addressed in promotional activities as well as in product formulation. However, product modification should be addressed in light of any cost increases they would involve.

- Respondents cited stronger disadvantages of *treated* nets, voicing concern about the noxious smell and potential danger of the insecticide to young children and pregnant women. Negative perceptions of treated nets appear to be based on previous experience with aerosols and coils (e.g., smell, irritation, and adverse health effects). Since smell and irritation are mild and transient in treated nets, negative perceptions are likely to be overcome when products are actually used. Promotional strategies should emphasize opportunities for product trial. In addition, IEC messages and product development should take into account consumer concerns about smell and safety. At the same time, since the smell of the insecticide dissipates shortly after treatment, consumers may think that the insecticide is no longer effective; some means should be found to indicate to the consumer that insecticide is present and still effective.

Access to ITMs

- Most consumers would have to travel quite far (an average of one hour by foot or 75 minutes by bus) to obtain their nets, especially those living in rural areas. In addition, fairly large proportions of nets (especially in Mansa and Kitwe sites) were provided by the public sector. Insecticide treatments for nets are virtually unavailable in the commercial sector. A key challenge will therefore be to make nets and treatments more widely accessible and available through the commercial sector, bringing them closer to where people live, with particular attention to rural areas.
- Promotional efforts should provide information on where nets and treatments can be obtained.

Mosquito net ownership, treatment, and appropriate use

- Net ownership in the study was moderate and non-owners, especially those in rural areas, said that the main reason they did not own a net was cost. A key challenge to increasing net ownership will be to make nets more affordable and countering perceptions of nets as unaffordable, given that over three-fourths of the people even in the highest SES category cited cost as a barrier to net ownership. Currently a fairly large proportion of nets is being provided by the public sector (e.g., health services, clinics, and projects), with the result that many people expect the cost of nets to be low. Commercial nets will need to be priced competitively with those distributed through the public sector or they must be seen as being sufficiently more desirable to warrant paying more for them. Possibly commercial nets would be seen as reasonably priced when weighed against the cost of multiple cases of malaria. Ideally, subsidized nets would be targeted to low income groups unable to afford commercial nets.
- Some non-owners, especially those living in or near Lusaka, felt that nets were unnecessary or said that they were not available, and special attention must be given to countering these perceptions. The fact that 28% of net-owning households owned more than one net and 36% of households obtained their nets within the past 2 years shows that active interest in nets is growing.
- Because brands of nets were generally unknown, commercial players will need to develop and market strong brands of nets that are associated with the benefits that consumers want (e.g., kills mosquitoes, reduces malaria, is a high quality and effective brand, is a long-term solution to mosquito problems, is safe to use around children, is affordable, etc.)
- The proportion of children under five sleeping under nets in net-owning households was moderate, while the proportion of pregnant women sleeping under nets was low. Promotional and educational efforts are necessary to encourage net use by children under five and pregnant women.
- Given that consumers slept under nets only approximately three-fourths of the year, behavior change strategies are needed to encourage year-round net use and address any barriers to doing so.

- The concept of treating nets with insecticide was fairly well known in some areas, but not in others. However, net treatment rates were low everywhere; few nets were treated after purchase and even fewer were re-treated on a regular basis. It is essential to make treatments available; then promotional and communication efforts are needed to raise treatment rates. Such a campaign can build on respondents' positive reaction to the concept of ITMs, particularly emphasizing the effectiveness of net treatment in killing/repelling mosquitoes and other insects — highly valued attributes of mosquito control products that are not currently associated with nets. A long-lasting net would help to overcome the challenge of getting people to re-treat nets, but that as long as untreated nets are used, re-treatment will be necessary.
- Half of nets owned by households that had been washed were washed at least once a month. Promotional efforts must address how often nets should be treated/re-treated as well as washed in between treatments. Long-lasting treated nets must be able to withstand frequent washing.
- Insecticide treatments for nets were almost always obtained free through the public sector or on a subsidized basis through the commercial sector. Brands of insecticide treatments for nets were generally unknown. A key challenge will be to increase involvement of the commercial sector in the production and distribution of net treatment. Strong branding of net treatments that have the attributes that consumers desire is encouraged as well.

Consumer net preferences

- Consumer preferences for net size, shape, and color do not match what they currently own, which is largely a reflection of availability. Product development should take into consideration consumer preferences for net size (king and double), shape (round/conical) and color (generally white, but light green, dark blue, pink, light blue as well) to raise sales and enhance strength of brand. (It should be noted that in the qualitative research, consumers explained that they prefer conical nets because they are easier to hang, but that they prefer the roominess of a rectangular net. If a rectangular net that hangs from a single point could be devised, it would combine two features that consumers like.) However, product modification should be addressed in light of any cost increases they would involve.

6.4 OTHER MOSQUITO CONTROL PRODUCTS

Awareness of mosquito control products and methods

- While awareness of commercial insect control products — other than mosquito nets — was moderately high, current use of these products and frequency of purchase was low, especially in rural areas. Nets appear to hold a prominent role in household mosquito control, since a higher proportion of households reported using nets than other commercial insect control products. Promotional efforts should emphasize the insecticide characteristics of treated nets (e.g. killing mosquitoes and other insects), which are likely to have strong appeal to consumers. In addition, efforts should stress that use of insecticide treated nets is economical in the long run.
- Consumers reported that coils were generally bought in kiosks, markets, and general shops. Aerosol sprays were generally purchased in supermarkets or general shops. The fact that a large proportion of commercial insect control products such as coils and aerosols are bought in general shops, as are the majority of nets, shows that the insect control market is not specialized among traders and that nets and ITMs can be sold together with nets in these commercial settings.

Perceptions of mosquito control attributes, products, and brands

- The most highly valued attributes that consumers wanted in an insect control product were that it kills mosquitoes and reduces malaria. They also wanted a product that is a high quality and effective brand, is a long-term solution to mosquito problems, and is safe to use around children. While consumers rated sprays/aerosols higher than any other product on killing mosquitoes and other insects, mosquito nets were rated highest on the other attributes that consumers valued most. The fact that consumers strongly value the key attributes that ITMs deliver and that nets are already associated with many of these attributes is very positive for ITM promotion and sales. ITM promotion activities should highlight the fact that treated nets kill mosquitoes, kill insects other than mosquitoes, are a long-term solution to the mosquito problem, reduce malaria, and are safe to use around children. Branded nets should stress that they are a high-quality and effective brand.

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